Enumeration of Juvenile and Adult Coho Salmon at Black Creek, Vancouver Island, 2008

P. Van Will, H.W. Stiff, D. Nagtegaal, E. Miyagi, and K. Duncan

Fisheries and Oceans Canada
Stock Assessment
Science Branch, Pacific Region
150 – 1260 Shopper's Row
Campbell River, British Columbia
V9W 2C8

2011

Canadian Manuscript Report of Fisheries and Aquatic Sciences 2951

Fisheries and Oceans Pêches et Océans

Canada

Canadian Manuscript Report of Fisheries and Aquatic Sciences

Manuscript reports contain scientific and technical information that contributes to existing knowledge but which deals with national or regional problems. Distribution is restricted to institutions or individuals located in particular regions of Canada. However, no restriction is placed on subject matter, and the series reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries and aquatic sciences.

Manuscript reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report is abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Numbers 1-900 in this series were issued as Manuscript Reports (Biological Series) of the Biological Board of Canada, and subsequent to 1937 when the name of the Board was changed by Act of Parliament, as Manuscript Reports (Biological Series) of the Fisheries Research Board of Canada. Numbers 1426 - 1550 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Manuscript Reports. The current series name was changed with report number 1551.

Manuscript reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out-of-stock reports will be supplied for a fee by commercial agents.

Rapport manuscrit canadien des sciences halieutiques et aquatiques

Les rapports manuscrits contiennent des renseignements scientifiques et techniques ques qui constituent une contribution aux connaissances actuelles, mais qui traitent de problèmes nationaux ou régionaux. La distribution en est limitée aux organismes et aux personnes de régions particulières du Canada. Il n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques du ministère des Pêches et des Océans, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports manuscrits peuvent être cités comme des publications complètes. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports manuscrits sont résumés dans la revue *Résumés des sciences aquatiques et halieutiques*, et ils sont classés dans l'index annual des publications scientifiques et techniques du Ministère.

Les numéros 1 à 900 de cette série ont été publiés à titre de manuscrits (série biologique) de l'Office de biologie du Canada, et après le changement de la désignation de cet organisme par décret du Parlement, en 1937, ont été classés comme manuscrits (série biologique) de l'Office des recherches sur les pêcheries du Canada. Les numéros 901 à 1425 ont été publiés à titre de rapports manuscrits de l'Office des recherches sur les pêcheries du Canada. Les numéros 1426 à 1550 sont parus à titre de rapports manuscrits du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 1551.

Les rapports manuscrits sont produits a l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Canadian Manuscript Report of

Fisheries and Aquatic Sciences 2951

2011

ENUMERATION OF JUVENILE AND ADULT COHO SALMON AT BLACK CREEK, VANCOUVER ISLAND, 2008

by

P. Van Will[1], H.W. Stiff[2], D. Nagtegaal[1], E. Miyagi[1], and K. Duncan[2]

[1] Fisheries and Oceans Canada
Stock Assessment
Science Branch, Pacific Region
150 - 1260 Shopper's Row
Campbell River, British Columbia
V9W 2C8

[2] A'Tlegay Fisheries Society,
Campbell River, British Columbia V9W 2C8

© Her Majesty the Queen of Right of Canada, 2011

Cat. No. Fs 97-4/2951/E ISSN 0706-6473

Correct citation for this publication:

Van Will, P., Stiff, H.W., Nagtegaal, D., Miyagi, E., and Duncan, K. 2011. Enumeration of juvenile and adult coho salmon at Black Creek, Vancouver Island, 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2951: viii + 87 p.

TABLE OF CONTENTS

LIST OF TABLES v

LIST OF FIGURES vi

LIST OF APPENDICES vi

ABSTRACT vii

RÉSUMÉ viii

INTRODUCTION 1

- Study Area 1

METHODS 2

- Physical Observations 2
- Smolt Operations 2
- Adult Operations 3
  - Adult Enumeration and Sampling 3
  - Mark-Recapture 3
- Data Analysis 4
  - Escapement Estimation 4
  - Exploitation Rate 4
  - Marine Survival 5

RESULTS 5

- Juvenile Enumeration 5
  - Environmental Conditions 5
  - Fence Counts 5
  - Smolt Aging 5
  - Smolt Size 6
  - CWT Tagging 6
- Adult Enumeration 6
  - Environmental Conditions 6
  - Biological Sampling 7
  - Fish Condition 7
  - Sex Composition 7
  - Age Composition 7
  - Age and Sex Composition 7
  - Size Distribution 7
  - Size at Age 7
  - Coded Wire Tags 8
  - Mark-Recapture 8
- Exploitation Rate and Marine Survival 9

DISCUSSION 10

- Smolts 10
- Adults 10
- Escapement Estimation 12

  - Exploitation Rate 12
  - Marine Survival 12

RECOMMENDATIONS 13

  - Juvenile Enumeration Operations 13
  - Adult Enumeration Operations 13
  - Spawn Survey Operations 14

ACKNOWLEDGEMENTS 14

LITERATURE CITED 15

TABLES 16

FIGURES 30

APPENDICES 39

LIST OF TABLES

Table 1. Environmental conditions during smolt fence operations, 2008 ... 16

Table 2. Scale age composition of Black Creek coho smolts sampled at the juvenile weir, April 2 – May 26th, 2008. Fully aged fish. ... 18

Table 3. Scale age composition of Black Creek coho smolts sampled at the juvenile weir, April 2 – May 26th, 2008. Partially aged or un-aged fish. ... 18

Table 4. Summary of coho smolt scale ages by sampling period, 2008. ... 18

Table 5. Summary of 2008 length (mm) and weight (g) at age of coho smolts ... 19

Table 6. Length frequency of coho smolts by period, 2008. ... 19

Table 7. Size statistics for coho smolts by sampling period, 2008. ... 20

Table 8. Summary of catches and coded-wire tag releases of coho smolts by tag series and sampling date, 2008. ... 21

Table 9. Daily upstream migration through the adult counting fence, 2008. ... 22

Table 10. Relative condition of maturity of Black Creek coho as assessed subjectively at the counting fence, 2008. ... 23

Table 11. Summary of coho adult scale ages. ... 23

Table 12. Age and sex composition for adult coho, 2008. ... 23

Table 13. Fork length (cm) frequency distribution data for adult and jack coho, 2008. ... 24

Table 14. Statistical summary of fork length (cm) data for adult and jack coho, 2008. ... 24

Table 15. Length-at-age for aged adult coho, 2008. ... 24

Table 16. Summary of coded-wire tag detections during coho movement through the counting fence, 2008. ... 25

Table 17. Summary of coho adult and jack tag operations at the counting fence, 2008. ... 25

Table 18. Summary of recoveries of coho from spawning ground sampling sites, 2008. ... 25

Table 19. Summary of adult coho recoveries by date, sex, and mark presence (N=No, Y=Yes) on the Black Creek watershed spawning grounds, 2008. ... 26

Table 20. Mark application and recovery by sex for the 2008 Black Creek coho escapement, comparing recovery rates for T-bar tagged versus left opercular-punched fish. ... 26

Table 21. Petersen mark/recapture escapement estimation based on Black Creek adult coho marked fish and recoveries. ... 27

Table 22. Black Creek adult coho marks and recoveries, by date of recapture, for Bayesian escapement population estimation. ... 27

Table 23. Bayesian posterior probability distribution statistics for Black Creek adult coho population estimate, 2008. ... 28

Table 24. Estimated marine survival and associated exploitation rate in marine fisheries, 1976-2008. ... 29

LIST OF FIGURES

Figure 1. The Black Creek watershed and sub-basin boundaries (after Brown et al. 1999). 30

Figure 2. The Black Creek system, showing the locations of the fence and recovery sampling sites, by reach. 31

Figure 3. Black Creek water level and temperature during the 2008 smolt outmigration period. 32

Figure 4. 2008 Black Creek daily coho smolt out-migration. 32

Figure 5. Smolt length frequency by age class (N=583). X-axis value represents low end of category (e.g., Length Class "100" represents fish 100-109 mm). 33

Figure 6. Black Creek coho smolts length-weight relationship, (N = 448). 33

Figure 7. Adult and jack coho escapement and corresponding water levels, 2008. 34

Figure 8. Air and water temperature time-series during adult migration period, 2008. 34

Figure 9. Length-frequency distribution of coho adults and jacks, 2008. 35

Figure 10. Sequential plots of the posterior distribution of the Bayesian population estimate for 2008 coho adults from marked releases. Final sequence is depicted by solid line. Modal estimate is 1,120 adults (95% confidence range: 1,056 – 1,217). 36

Figure 11. Minimum and maximum population estimates and precision ($1,056 < Pop < 1,217$; $\alpha = 0.05$) based on posterior distribution of the Bayesian population estimate for coho adults, 2008. 36

Figure 12. Black Creek adult coho fence counts and Bayesian population estimates, 2003-2008. 37

Figure 13. Trend in Black Creek adult coho marine survival, by return year, 1986-2008. 37

LIST OF APPENDICES

Appendix A. Daily water level and temperature during the 2008 spring outmigration. 39

Appendix B. Daily catch of coho smolts and fry at the Black Creek fence, 2008. 41

Appendix C. Daily catch of other species at the Black Creek out-migration fence, 2008. 43

Appendix D. Individual coho smolt length (mm), weight (g), and scale age, 2008. 45

Appendix E. Individual coho smolt length (mm), weight (g), and condition factor (KC), 2008. 60

Appendix F. Daily water level and temperature during the fall 2008 adult migration period. 65

Appendix G. Adult coho data, Black Creek fall fence, 2008. 66

Appendix H. Non-coho data, Black Creek fall fence, 2008. 87

ABSTRACT

Van Will, P., Stiff, H.W., Nagtegaal, D., Miyagi, E., and Duncan, K. 2011. Enumeration of juvenile and adult coho salmon at Black Creek, Vancouver Island, 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2951: viii + 87 p.

The counting fence on Black Creek was operated between April 1st and June 4th, 2008, to enumerate and tag coho smolt out-migration. During the spring program, a total 34,201 smolts were captured, and sampled, of which 12,358 (35%) were successfully coded-wire tagged and released. Factoring for short-term tag loss of 1.5% results in 10,269 effectively coded-wire tagged smolts. The out-migration was 74.5% age 1 smolts and 25.5% age 2s. The adult fence was operated from October 7th to November 15th, and spawn surveys were conducted from November 14th to December 8th. A total of 891 large adults (male to female ratio of 1 : 1.3) were enumerated, and 880 were tagged for mark-recovery escapement estimation. 444 jacks were enumerated. CWTs were detected in 58 adults and 8 jacks, indicating a low (7.2%) detection rate. The single-census Petersen mark-recapture population estimate for adult coho was 1,192 ± 51. The mode of the Bayesian population estimate for adult coho escapement was 1,120, with a 95% highest probability density of 1,056 – 1,217. Exploitation rate was assumed to be equivalent to the aggregated estimate derived elsewhere for Vancouver Island Georgia Strait coho: 5.8%. Marine survival was estimated to be 0.76% for Black Creek adult coho, the lowest on record.

RÉSUMÉ

Van Will, P., Stiff, H.W., Nagtegaal, D., Miyagi, E., and Duncan, K. 2011. Enumeration of juvenile and adult coho salmon at Black Creek, Vancouver Island, 2008. Can. Manuscr. Rep. Fish. Aquat. Sci. 2951: viii + 87 p.

La barrière de dénombrement du ruisseau Black a été utilisée du 1er avril au 4 juin 2008 pour dénombrer et marquer des smolts de saumons cohos en dévalaison. Au total, 34 201 smolts ont été capturés durant le programme d'échantillonnage de printemps, dont 12 358 (35 %) ont été munis d'une micromarque magnétisée codée avant d'être relâchés. Après le taux de perte des micromarques à court terme de 1,5 % considéré, il reste 10 269 smolts munis d'une micromarque magnétisée codée. La dévalaison était de 74,5 % chez les smolts d'âge 1 et de 25,5 % chez les smolts d'âge 2. La barrière de dénombrement des adultes a été utilisée du 7 octobre au 15 novembre, et des relevés des pontes ont été effectués du 14 novembre au 8 décembre. Au total, 891 saumons adultes de grande taille (rapport des sexes de 1 mâle:1,3 femelle) ont été dénombrés, dont 880 qui ont été marqués aux fins d'estimation de l'échappée par marquage-recapture. On a également dénombré 444 mâles précoces. Le repérage de 58 adultes et de 8 mâles précoces munis d'une micromarque magnétisée codée indique un faible taux de détection (7,2 %). L'estimation du nombre de cohos adultes par recensement unique (méthode Peterson) par marquage-recapture était de 1,192 ± 51. Le mode de l'estimation bayésienne de l'échappée pour les cohos adultes était de 1,120, et la densité de la probabilité la plus élevée de 95 % était de 1,056 à 1,217. Le taux d'exploitation était présumé équivalent à l'estimation globale dérivée d'un autre endroit pour les saumons cohos provenant du détroit de Georgia (île de Vancouver), c'est-à-dire 5,8 %. Le taux de survie en mer des saumons cohos provenant du ruisseau Black a été estimé à 0,76 %, soit le plus faible taux enregistré à ce jour.

INTRODUCTION

This report documents the 2008 smolt and adult enumeration programs for coho salmon (*Oncorhynchus kisutch*) at the Black Creek fence. Both enumeration programs are based on sampling conducted at the permanent fence site located 100 m upstream of tidal influence, about 40 m downstream from Seaview Road in Miracle Beach Provincial Park. A series of projects have been conducted sporadically at this location since 1968 (Baillie, Simpson & Taylor 2004) and an uninterrupted data set has been compiled, under the present program, since 1984. In addition to coho, Black Creek supports populations of coastal cutthroat trout (*O. clarki*), and rainbow trout (*O. mykiss*).

The spring program is designed to assess the out-migration of coho smolts with respect to numbers, size and age composition, and migration timing. Coded-wire tags (CWTs) are implanted in smolts during specific periods throughout the migration.

Adult coho returning in the fall are counted at the same location utilizing a modified fence configuration. The general structure has been described by Baillie et al. (2004). Modifications were made in 2001, replacing the steel panels with aluminium grates and extending the cat-walk for a further 1.5 m beyond the downstream edge of the concrete sill. The traps were also modified to incorporate an adjustable height exit at the upstream end, through which fish could be counted into the system during flooding, eliminating the necessity to net each one. Each exit features a right-angle aluminium plate, leading upstream, to increase the visibility of fish and counting accuracy under turbid flows. In 2003, the fence centre panels were cut in half lengthways and Teflon runners were attached along the contact edge with the A-frame, to facilitate removal during high water events.

Spawners counted through the fence are enumerated by sex, and sampled for length, age and maturity. Carcasses are sampled and heads are recovered from coded-wire tagged fish. Since 1984, mark-recapture has been the primary method of escapement estimation, with marking conducted at the fence and recovery surveys conducted at up to 15 upstream sites.

Recoveries of coded wire tagged coho in the escapement are used with catch recoveries and release data to estimate ocean survival and exploitation rates. The utility of the data depends on long-term monitoring of escapements, smolt abundances, survivals, catches, exploitations and escapements. Data from the project, along with other sources, is used to predict coho returns, ocean survival and migration patterns for the south coast of British Columbia.

STUDY AREA

Black Creek is a moderately sized coastal stream located 30 km north of Courtenay, on the east coast of Vancouver Island. It is approximately 31 km long and flows into the Strait of Georgia at Elma Bay (Figure 1). The watershed area is approximately 81 km^2 (Brown, Barton & Langford 1996) and predominantly comprised of agricultural lands with forested areas in the upper catchment. Lower in the watershed, small lakes, of which Northy Lake is the largest, beaver ponds, and swampy areas are distributed among the stream reaches (Figure 2). These areas contribute to the characteristic humic stained flows in the lower sections via a number of tributaries, the largest being Millar Creek. Discharge is largely dependent on rainfall; irrigation and drainage projects have reduced already low summer flows in Black Creek, such that, in summer, some sections of the creek are dry. In contrast, fall freshets can result in a discharge of up to 60 m^3/s (Labelle 1990). Once the storage capacity of the watershed is reached, the creek responds rapidly to rainfall, and prolonged flood events tend to be the norm.

METHODS

PHYSICAL OBSERVATIONS

General weather observations were made daily and recorded as subjective comments on rainfall, cloud cover and wind strength. Measurements of river height were normally made each day at about 8:00 a.m. Water level was recorded from a staff gauge (± 5 mm) located approximately 250 m upstream of the fence. Minimum, mean, and maximum daily water temperature were calculated based on hourly samples downloaded from a Tidbit temperature datalogger (No. 879280) installed upstream of the fence site.

SMOLT OPERATIONS

The basic sampling and tagging procedures resembled other years of the program. Weekly duties were divided into two days coded-wire tagging and five days enumerating only. The trap was installed on April 1st and maintained until June 4th. Catches from the previous day were removed from the holding boxes at about 8:00 a.m. and sorted into buckets, by species. All sampling and tagging was performed on anaesthetized smolts using tricaine methane sulphonate (MS-222) as the anesthetic.

Random length samples were collected by measuring, approximately, every 10th coho smolt on days when coded wire tags (CWTs) were applied. The length-weight relationship for coho smolts was derived based on the power function:

Equation 1 $W = a * L^b$

where W = weight in grams and L is fork length in millimeters. Condition factor (K) was calculated for each smolt as a measure of the fish's degree of well-being or robustness (Williams 2000), as:

Equation 2 $K = 100{,}000\ W / L^3$

Data collection to determine the age structure of the population was collected as one continuous group of random sample from April 27 to May 26, 2008 totaling 600 samples (every 10th fish for large volumes and every 5th fish for small volumes). In past years, the program sampling period was stratified into three separate groups and a non-random (by each 5mm length group) age sample was taken for each strata. The age composition of smolts was calculated for each of the three sampling periods after Ketchen's stratified sub-sampling method (Ricker 1975). This methodology was abandoned in 2008 with the theory that the same age composition breakdown could be obtained via a non-stratified random sample.

Smolts were injected with a CWT, which was applied with either a MK II or a MK IV Tagging Unit (Northwest Marine Technologies, Shaw Island, WA 98286). Tagged coho were placed into a floating holding box to recover from the operation, and released periodically through the day. Untagged coho (no tag detection by hand-held wand) were re-tagged. Moribund fish were released untagged. Four short-term tag retention tests were conducted (May 1st, 7th, 10th and 20th) to estimate the number of CWT'd coho smolts that lost their tag in the first 24 hours.

While coho fry (which are not consistently captured by the screen size used in traps and panels) and other salmonids were enumerated at the counting fence, meristics data were not collected this year. Non-salmonids were enumerated by species.

ADULT OPERATIONS

Adult Enumeration and Sampling

The counting fence was installed on October 7th and operational until closure on November 18th.

The fence traps were inspected at 8 a.m., and periodically through the day as warranted by fish movement. Individual fish were netted from the trap and sampled for fork length (± 5 mm), sex (female, adult male or jack) and the presence of fin clips or external marks, including hook scars and severe injuries. Weights were not recorded. The presence of a CWT in fin-clipped coho was verified with a Northwest Marine Technology wand tag detector. Fish condition was assessed using the subjective categories of:

1. Silver (no spawning colour or characteristic morphological changes commonly associated with spawning coho);
2. Green (some darkening of body colour but little morphological change);
3. Mature (colour and morphological characteristics of a spawning coho but eggs or sperm not easily expelled); and
4. Ripe (similar to a mature fish, except, eggs and sperm readily expelled with little or no force).

Jack coho were defined as those male fish with a fork length of less than 44 cm, although this category may include some small adults. Weights were not measured in 2008. Other salmonid species encountered at the fence were identified, sexed and measured for fork length (± 5 mm).

Mark-Recapture

Adult and jack coho were tagged with a numbered, clear T-bar anchor tag (TBA-2, 2 in., Hallmark Pty Ltd., South Australia, 5211). Tags were inserted into the dorsal musculature on the left side of the dorsal fin, between the anterior pterygiophores. A 7 mm hole was punched in the left operculum of each tagged fish. Short-term tag mortality was assessed by retaining five tagged adults in the adult trap box for 24 hours.

Recoveries of marked and unmarked coho were conducted at 8 sites (Figure 2) during spawning ground surveys between November 14th and December 8th. All fish encountered were checked for marks. Recoveries were classified as untagged, tagged (T-bar tag), or lost tag (opercula punch but no tag). Tag numbers were noted, as were other marks such as adipose clips present or unknown due to the condition of the fish. The heads from carcasses that gave a positive response when tested for the presence of a CWT were preserved for analysis.

DATA ANALYSIS

Escapement Estimation

Coho escapement population estimates N and variance were derived from single-census Petersen mark-recapture methods (Ricker 1975), using both the bias-corrected hypergeometric estimator and the direct binomial estimator for small samples without replacement. The former was calculated as:

Equation 3 $N = ((M+1) * (C+1) / (R+1)) - 1$

where M is the number of marks applied, C is the number of fish recovered, and R is the number of marks in the total fish recovered. The variance of this estimate was calculated from:

Equation 4 $\mathrm{Var}\,(N) = (M+1) * (C+1) * (M-R) * (C-R) / ((R+1)^2 * (R+2))$

The binomial estimator can be calculated as:

Equation 5 $N = ((M * (C+1) / (R+1))$

with variance:

Equation 6 $\mathrm{Var}\,(N) = M^2 * (C+1) * (C-R) / ((R+1)^2 * (R+2))$

Additional estimates for coho adults and adults + jacks populations were derived from temporal sub-sets of the mark-recapture data using the sequential Bayesian approach (Gazey & Staley 1986). This method has been used in a majority of previous studies to account for under-reporting of tags in visual surveys and to eliminate tag loss corrections (Taylor, Baillie & Simpson 2006). It determines the posterior distribution of probabilities associated with population size from the joint probabilities of mark recovery rates. Calculated population parameters include the mode, a maximum likelihood estimate of the sampling distribution, and the 95% highest probability density (HPD). It should be noted that, while the HPD has equivalence to a confidence interval, it forms a direct probability statement about population size (Gazey & Staley 1986). The mode is reported as a single value which denotes that each integer between the population bounds has been evaluated.

Exploitation Rate

The percent exploitation rate (ER) of adult Black Creek coho is calculated as:

Equation 7 $ER = 100\, C / (C + M + E)$

where C is the estimated fishing mortality, M is the known pre-spawn natural mortality, and E is the adult escapement.

Marine Survival

Percent marine survival rate (S), is calculated as:

Equation 8 $$S = 100\,(C + M + E) / R$$

where C is the estimated fishing mortality, M is the pre-spawn natural mortalities, E is the tagged adult escapement, and R is the number of tagged smolts in 2007, corrected for long-term tag loss.

RESULTS

JUVENILE ENUMERATION

Environmental Conditions

The smolt fence was operational from April 1st to June 4th, 2008. However, the top fence panels were removed for a few days to relieve pressure on the fence due to water levels above 80 cm between April 6th and 10th (Table 1). Normal smolt trapping resumed on April 11th, although high waters occurred again on April 13th. Water levels generally diminished for the rest of April and through the peak smolt migration period in May, averaging about 60 ± 7.5 cm in depth (Figure 3).

Daily air temperature averaged 9.9°C ± 3.2°C (range 4.2°C to 16.0°C) during the smolt migration period (Table 1, Appendix A). Mean daily water temperature was 10.5 ± 2.9°C (range 4.3°C to 16.4°C). By the end of the smolt out-migration period in late May, mean daily water temperatures were oscillating around 15°C (Figure 3).

Fence Counts

Smolt out-migration began in earnest in late April, with peak daily migration occurring on May 7-8th (2,800 smolts per day) and similar spikes of up to 2,500 coho smolts per day occurring between May 12-20 (Appendix B)[1]. 75% of the smolt migration occurred between May 6th and May 20th (Figure 4). A total of 34,201 coho smolts were enumerated. 1,838 coho fry were also counted.

Smolt Aging

600 smolts were scale-sampled for aging, including 100 in Period 1, 80 in Period 2, 290 in Period 3, and 130 in Period 4 (Appendix D). Of the 427 fully-aged scales, 74.5% were from brood year 2007 (age 1.0) and 25.5% were from brood year 2006 (age 2.0) (Table 2). For 157 partially-aged scales, the marine annulus was undetectable, and of 16 unreadable scales, 10 were due to the scales mounted upside down (Table 3).

---

[1] Daily counts of non-coho species through the smolt fence are listed in Appendix C. Coastal cutthroat trout (*O. clarki*) numbered 192 adults and 49 juveniles. No rainbow trout (*O. mykiss*) were identified (Appendix A). Pacific lamprey (*Lampetra tridentatus*) were less numerous than other years with only 19 enumerated at the fence, as well as 42 sculpins (*Cottus asper or C. aleuticus*).

Though age 1.0 smolts predominated throughout the out-migration period, age 2.0 fish contributed 75% of the fully aged fish in Period 1. The contribution of age 2.0s subsequently diminished in Period 2 (60%), Period 3 (12%), and Period 4 (less than 5%) (Table 4). However, the incidence of partially aged M.0's accounted for up to 37% of scales in the last two periods, which might obscure the actual contribution of age 2.0's (Table 5).

Smolt Size

A total of 400 smolts were measured for fork length and fresh weight (Appendix E). Length frequency data indicate a bi-modal distribution, with peaks at 125-135 and 170-180 mm, most likely due to the large size of age 2.0 fish (Table 6, Figure 5).

Mean coho smolt fork length for all periods was 141.9 ± 25.8 mm (range 70 – 255 mm) (Table 7). Mean smolt weight was 30.7 ± 16.1 mm (range 5 – 155 g). Average length of smolts declined from Period 1 to Period 4, from 159.5 ± 25.9 mm to 124.5 ± 16.1 mm, as did average weight (Table 7). However, some of the largest fish and the best condition factor ($K \approx 0.9$ to 1.1) occurred in Period 3 (Appendix E).

The length/weight relationship (Figure 6) for measured coho smolts was:

$$\mathit{Weight}\text{ (g)} = 0.00001 * \mathit{Length}\text{ (mm)}^{2.9124}; \quad (r^2=0.93, n=400)$$

CWT Tagging

Coded-wire tagging procedures resulted in a total of 10,428 successfully coded-wire tagged smolts, representing 30% of the out-migration (Table 8).

Pre-sample mortalities (499 fish) affected <1.5% of the total catch. However, the majority (97%) of these mortalities occurred on 05-May, perhaps due to trap box overcrowding as coho smolt migration commenced in full. Tagging mortalities (2) were low, representing <0.02% of the tagged fish (Table 8).

The short-term 24-hour tag loss rate was estimated at 1.5%, based on four retention tests in which 6 of 383 tagged smolts that did not retain their CWTs (Table 8). Factoring the number of CWT'd smolts by the short-term tag loss percentage resulted in 10,269 effectively tagged smolts.

ADULT ENUMERATION

Environmental Conditions

The adult counting fence was installed and operational from October 7th to November 18th (Appendix F). Black Creek flows remained below the 1 meter level (mean 85 cm) for most of October. The month of October was punctuated by only one migration event on October 17th, associated with a slight increase in water levels due to rain (Figure 7). Peak coho migration was coincident with the wet weather and higher creek flows in early November. High water levels during November 8th – 10th breached the fence; at least 16 visually-observed coho escaped un-sampled. However, it is uncertain how many coho may have migrated upstream during this time.

Spot air temperatures varied from +11 to -1°C (mean 6.0°C), though spot water temperatures remained above 6°C, and averaged about 7.6°C during the migratory period (Figure 8).

Biological Sampling

A total of 1,354 coho consisting of 891 adults and 444 jacks were counted, sampled, and marked at the fence between October 7th and November 13th (Table 9). A further 19 coho were observed, but not fully sampled or sexed.

Fish Condition

The majority of coho returns (60%) were in "green" condition, followed by "mature" (32%), and "silver" (7%) (Table 10). No "ripe" fish were identified at the fence. Jacks comprised almost 50% of the "silvers", followed by females (40%). Over half of the males assessed at the fence, but only 35% of females, were "mature".

Sex Composition

The tally of 391 males (44%) and 500 females (56%) yielded a male-to-female sex ratio of 1 : 1.3 at the fence (Table 10).

Age Composition

A total of 89 coho were sampled for scales at the counting fence (Table 11). Of that number, only 43 coho were successfully aged. 88% of aged fish were 1.1 (Gilbert age 3_2) from brood year 2005, and 12% were age 2.1 (Gilbert age 4_3) from brood 2004. For 41 scales, the freshwater annulus could not be distinguished and all fish were classified as M1 (1 marine annulus). Of 5 unreadable scales, 4 were simply mounted upside down.

Age and Sex Composition

All 43 successfully aged fish were also sexed. Age 1.1 females and males comprised approximately 54% and 35% of the samples, respectively (Table 12). Age 2.1 fish represented only 12%.

Size Distribution[2]

The modal length frequency for adult coho migrants was in the 71-75 cm range for females, 76-80 cm for large males, and 31-35 cm for jacks (Table 13). The mean length for adult males (75.0 cm) was not significantly larger than for females (71.1 cm) ($P > 0.05$); jack coho averaged 33.9 cm (Table 14). Due to the large percentage of returning jacks, the length frequency distribution is essentially bimodal (Figure 9).

Size at Age

Size of aged fish indicates age 2.1 females to be about 6 cm longer in fork length than age 1.1 females, which averaged 68.6 cm (Table 15). Age 1.1 males averaged 71.2 cm. No male 2.1 fish were sampled.

---

[2] Returning coho weights were not recorded in 2008.

Coded Wire Tags

Of 1,354 total coho counted at the fence, 1,248 were tested for the presence of a CWT, including 870 adults and 377 jacks (Table 16). Coded-wire tags were positively located in 58 large adults (35 females and 23 males) and 8 jacks, In total, CWTs were detected in 5.3% of fish examined, and 7.2% of adults examined.

Mark-Recapture

Of the observed 1,354 coho migrants, 882 were tagged with a T-bar anchor tag, combined with a left opercula punch (Table 17). The 882 tagged coho included 878 large adults (495 females and 385 males), and 2 jacks. There were no immediate mortalities due to capture, handling, or tagging, and no 24-hour delayed mortalities. Thus tag mortality was assumed negligible.

Recoveries of marked and unmarked coho were conducted at 8 stream reaches between November 14^{th} and December 8^{th} (Table 18, Table 19). No patterns in spawner distribution between reaches were apparent from the recoveries. Total carcasses recovered (194) represented 15% of the fence count. The male:female sex ratio obtained from pooled spawning ground coho recoveries was 1 : 1.2. As usual, the recovery of jack carcasses was problematic; only 5 were encountered during stream surveys, i.e., 1.1% of jack observations at the fence.

All carcasses encountered were checked for marks. Of the 194 adults examined, 143 marked coho were recovered, 81 of which had T-bar tags, while an additional 62 had operculum hole-punches but were missing the T-bar tags (Table 20). Thus the T-bar tag loss percentage was 43%. The male:female sex ratio of marked carcass recoveries was 1 : 1.3, while, of the 51 unmarked coho carcasses recovered, a slight majority were males (1 : 0.8).

Simple Petersen Mark-Recapture Population Estimates

A single-census Petersen mark-recapture estimate for adult coho (ignoring jacks) was obtained from the bias-corrected *hypergeometric estimator* (Equation 3) for population size as $N = 1{,}192 \pm 46$ (Table 21). Since the ratio of marked recaptures to catch exceeds 0.1, it may be more appropriate to use the binomial confidence interval calculation (Seber, 1982).The *binomial estimator* (Equation 5) for adult coho was calculated as $N = 1{,}192 \pm 51$.

Bayesian Posterior Probability Mark-Recapture Population Estimates

The *posterior probability distribution* for adult coho was constructed from 25 time intervals (T) associated with available marks (M) in the spawning population at time T, the observed number of coho carcass encounters (C), and the number of marks recovered (R) in the encounters (Table 22). The weighted median and mean of the posterior probability distribution were 1,127 and 1,131 ± 1.6 fish, respectively (Table 23).1001 discrete population runs were modeled between bounds of 1,000 – 1,500 individuals. These data provided a modal adult population estimate of 1,120 fish (Figure 10), with the highest probability density of 1,056 – 1,217, $\alpha = 0.05$) (Figure 11).

EXPLOITATION RATE AND MARINE SURVIVAL

Virtually all coho from the major South Coast hatcheries have been marked since 1997 (a pelvic fin clip in the first year and an adipose clip thereafter). This was in anticipation of selective mark fisheries, which are intended to harvest hatchery but not wild production. 1997 was the last year when major non-selective fisheries occurred in southern BC. Since Black Creek coho are a wild stock, smolts were not adipose clipped between 1997 and 2002. However, in 2003 and, again, in 2004 a portion of the smolt output was adipose clipped as well as coded-wire tagged. This was not repeated for any of the 2005 - 2008 smolt production cycles.

It is assumed that Black Creek coho are encountered in BC and Alaska sport fisheries at the same rate as marked coho from Quinsam Hatchery, 27 km from Black Creek. Since studies suggest that 10% of sport-caught coho do not survive after release, the exploitation rate in BC sport fisheries is assumed to be 10% of the Quinsam exploitation in BC catch-and-release recreational fisheries. However, for Alaskan fisheries all coho are retained so the Alaskan exploitation rate of Black Creek coho is assumed equal to Quinsam hatchery coho exploitation.

The percent exploitation rate (*ER*) of adult Black Creek coho is calculated based on CWT tag estimates, as:

$$ER = 100 * C / (C + M + E)$$

where C is the estimated fishing mortality, M is the known pre-spawn natural adult mortality (assumed to be negligible), E is the adult escapement.

CWT-tagged adult coho escapement E (79.3 fish) was derived from the proportion of tagged adult returns (7.08%) multiplied by the modal estimate of the total adult escapement (1,120). The proportion was calculated from the estimated number of CWT adults (64.4 CWTs, based on 58 observed fish adjusted for long-term tag loss of approximately 10%[3]), divided by the total number of adult coho examined at the fence for CWTs (910)[4].

Though catch data (C) are unavailable for Black Creek coho in 2008, an estimate of 5.8% exploitation was independently provided for Vancouver Island and Georgia Strait coho for 2008 (source: Pacific Salmon Commission) which can be used to back-calculate the catch mortality. Re-arranging the *ER* equation yields:

$$ER = 100 * (C / (C + 0 + 79.3)) = 5.8\%$$

$$C = 0.058 * 79.3 / 0.942$$

$$C = 4.9 \text{ (range: } 4.7 - 5.1)$$

Thus, catch of CWT'd adults is estimated as approximately 5 fish, with a range of 4.7 – 5.1 fish, based on minimum & maximum long-term tag loss rates (Taylor & Baillie, in prep.).

---

[3] Since CWT'd smolts were not adipose fin-clipped in 2007, long-term CWT tag loss cannot be directly determined. In previous years, long-term CWT tag loss in adult Black Creek coho was 6.4% (2004) (Taylor, Baillie & Simpson, in prep) and 14.6% (2005) (Taylor & Baillie, in prep), mean ~10%.

[4] Includes one un-sampled coho classified as an adult based on fork length, and 19 bypass adults.

Percent marine survival rate (S), is:

$$S = 100\,(C + M + E) / R$$

where C, M and E are calculated as for exploitation rate, and R is the number of tagged smolts in 2007 corrected for long-term tag loss. The estimated number of tagged smolts (R = 11,025) was then derived by applying the 10% long-term tag loss rate to an estimated 12,250 effectively tagged releases in 2007, after adjusting the 12,358 CWT'd smolts for short-term tag loss of 0.87% (Van Will et al., 2010b).

Thus:

$$S = 100 * (4.9 + 0 + 79.3) / 11{,}025$$

$$S = 0.76\%\ (\text{range: } 0.71 - 0.85\%)$$

Thus, marine survival of coho adults is estimated to be 0.76%, with a range of 0.71 – 0.85%, based on minimum & maximum long-term tag loss rates (Taylor & Baillie, in prep.). Estimated marine survival and exploitation rates since 1976 are presented in Table 24, where available.

DISCUSSION

SMOLTS

Smolt migration past the Black Creek fence in 2008 peaked in early May, similar to recent years. Enumerated coho smolt out-migrants (34,700), and total coded-wire tagged smolts (10,428) were roughly equivalent to 2007 outputs. Short-term tag loss estimates of 1.5% were used to estimate an effective tag release of 10,269 coded-wire tagged smolts migrating to sea in 2008 (30% of the total run).

As usual for Black Creek, age 1 fish predominated in the 2008 smolt migration (75% of aged fish). The length distribution of partially-aged (M0) fish (Figure 5) suggests that the majority of these fish were also age 1. The remainder of the migration was composed of age 2 smolts, which were most common during the first time period. Age 3 smolts have not been identified in the Black Creek out-migration since 2005, and none were identified in 2008, though a single 215 mm smolt, which could not be aged, was encountered (Figure 6).[5]

ADULTS

Black Creek coho upstream migration is highly dependent on precipitation events to raise creek levels. Over the past five years, peak coho migration has occurred shortly after the first significant rainfalls (Van Will et al., 2010a and 2010b). Similarly, in 2008, while water temperature and water level conditions were not a barrier to fish migration throughout October, upstream migration was largely confined to a spike of fish (mostly jacks) in mid-October, followed by a large pulse of adults and jacks in early November, each associated with pulses in water levels due to precipitation (Figure 7).

---

[5] Two age 3 smolts were captured in each of 2001 and 2002; 5 fish were found in 2003; and 1 in 2005.

Though a healthy 57% of females and 46% of males were in good silver condition during upstream migration in 2008[6], over half of the males assessed at the fence, but only 35% of females, were "mature". It is unknown how this difference in maturity level, combined with a slight imbalance in the adult sex ratio (1.3 females per male), might impact reproductive success on the spawning grounds.

The CWT detection rate (5.3% of coho examined) was considerably lower than the 15.5% tag detection rate in 2007 (Van Will et al., 2010b), and 29% in 2006 (Van Will et al., 2010a), and may be indicative of a trend in long-term tagging mortality associated with CWT tagging operations.

High water levels in 2008 affected fence operations in early November, during which time an unknown number of adult coho escaped unexamined. This may be a source of error in the estimate of marine survival (Equation 8), since the escapement estimate (*E*) is based in part on the total number of CWTs detected. However, since this count is tallied in ratio to the total number of fish checked, which is also biased downward to an unknown degree, it is not possible to determine the level of error in *E*, if any.

Taylor and Baillie (in prep.) showed that inter-annual variation in the distribution of spawners amongst spawning ground sites is high, indicate that spawner distribution does not appear to be a function of run size or available spawner habitat, or related in any obvious way to variations in hydrologic conditions.

The continuing high T-bar tag loss rate (43%, compared to 46% in 2007, and 33% in 2006) in spawning ground recoveries of marked coho is likely due to the type of tag used and future work will review alternative tag options such as mono-filament lined spaghetti tags. However, tag loss would have little repercussion on the population estimate if the accompanying opercula punch was identified each case. However, 15 tagged carcasses were recovered without evidence of an operculum punch, likely inadvertently omitted during tagging operations. If it were not for the T-bar tag, these fish would not be considered part of the tagged set. Evidently, since either tag can be lost, there might be "marked" fish in the recoveries which have lost both marks. Thus, of the 51 fish that were found without marks, some proportion may have been marked. The inability to account for these missing marks would bias the estimated population size upwards by an unknown amount.

Another curiosity shows up in the male:female sex ratio of unmarked adult recoveries. Of the 51 unmarked coho carcasses recovered, a slight majority were males (male:female sex ratio of 1 : 0.8), while the sex ratio for marked carcass recoveries was nearly identical to the fence count ratio, which displayed a majority of females (1 : 1.3). This seems to suggest that unmarked females were disproportionately absent from the spawning ground recoveries, for unknown reasons that may be related to problems with recovery efforts,

---

[6] Compared to 20% of females and 1% of males in 2006 due to drought conditions (Van Will, 2010a).

ESCAPEMENT ESTIMATION

The single-census Petersen hypergeometric and binomial mark-recapture estimators for adult coho population size were not significantly different from each other at the α = .05 level, being approximately 1,192 ± 50 fish.

The modal Bayesian population estimate was 1,120 adult coho with a 95% probability density of 1,056 – 1,217 fish.

Though Bayesian estimates have been consistently higher than single-census Petersen estimates since 2003 (Figure 12), in 2008 these estimates were not significantly different from each other at the $\alpha = 0.05$ level,

Estimated 2008 adult escapement numbers (1,120) represent 28% of the escapement population size (4,065) in the contributing brood year of 2004, indicate a declining trend in spawner replacement (Figure 12).

Taylor and Baillie (in prep.) describe the potentials for bias in generating Bayesian population estimates due to differential rates of recapture of tagged versus untagged fish, tag loss, and/or unobserved migration. They found that the initial trend of increasing population size stabilized in the final sampling sequences after mid-November, following the dispersal of unmarked coho into the spawning sites. In 2008, all upstream migrants were enumerated at the fence until November 8th; however, unobserved migrants after that date may be introducing some bias into the escapement estimate, and may thereby be affecting both marine survival and exploitation rates to some degree. In addition, the inability to account for missing marks would bias the estimated population size upwards by an unknown amount.

EXPLOITATION RATE

Commercial fisheries in southern BC have been designed to avoid coho catches, and incidentally-caught coho cannot be retained. However, non-selective sport and commercial fisheries still exist from the central coast to Alaska and in Washington State. Retention of unmarked coho by sport fishermen is now permitted in some terminal areas on the west coast of Vancouver Island. Though few Black Creek coho have occurred in these areas historically, those that were caught go largely undetected since unmarked coho are typically not scanned for the presence of a CWT. The catch is assumed to be small; fishing mortality is assumed to consist entirely of release mortality in sport fisheries (10%).

Significant conservation measures initiated in 1997 have reduced fishing mortality on Black Creek coho. The exploitation rate estimate has averaged 4.3% since 1998, down from an average of 73% for the years 1986-1997. However, the regional estimate of 5.8% for Vancouver Island-based Georgia Strait coho suggests catch rates for Black Creek coho may have increased in 2008.

MARINE SURVIVAL

Despite significant reductions in exploitation since 1998, Black Creek coho marine survival remains persistently suppressed at low levels, mirroring declines seen elsewhere in the Strait of Georgia basin (Figure 13). The 2008 marine survival estimate of 0.76%, the lowest in recent record (1976-2008), highlights the continued challenge faced by Strait of Georgia coho stocks.

RECOMMENDATIONS

This following recommendations arising out of this report may facilitate future Black Creek coho enumeration operations, data management, and analysis.

JUVENILE ENUMERATION OPERATIONS

1. Estimates of long-term CWT tag loss have varied from 4.6 to 16.4% for return years prior to 2006, but should be reviewed for more recent broods. Include adipose fin-clipping or equivalent marking to facilitate assessment of long-term CWT tag loss. Long-term tag loss studies require independent groups of CWT'd smolts which do not overlap with short-term 24-hour tag loss smolt sets.
2. Trap box over-crowding during peak out-migration can result in pre-sample smolt mortality rates of up to 5% on a given date, and potentially delay or impact tagging operations if surviving fish are significantly stressed. Extra attention to trap management during peak migration periods may alleviate this unnecessary mortality.

ADULT ENUMERATION OPERATIONS

1. Black Creek coho upstream migration is highly dependent on precipitation events to raise creek levels. However, precipitation is not measured. Nor is the time of day associated with temperature and water level readings recorded. It may be useful to install a data logger at the fence to monitor environmental conditions more accurately.
2. Though representing only 4% of scales taken, the majority of unreadable adult scales are due to field crew mounting the scales upside down. Since this failure level may introduce a disproportionate error factor in accurately determining age composition at low escapement levels, extra attention to scale sampling is advised.
3. High water levels in 2008 affected fence operations in early November, during which time an unknown number of adult coho escaped unexamined. This may lead to errors of unknown magnitude in the Bayesian escapement estimate and subsequent estimate of marine survival. To minimize untallied and un-sampled coho bypass events, extra efforts should be made to observe fish passage during high water periods, either through counting fence design modifications, or extra observer effort in response to precipitation forecasts.
4. Significant levels of tag loss identified over the last 3 years require future endeavors to look at other tag applications such as spaghetti tags to reduce this source of error.
5. Another potential source of bias in escapement estimation may be incurred by the loss of both tag and opercular punch holes from marked fish. It may be

useful to further mark the fish with an additional punch hole in the second operculum.

SPAWN SURVEY OPERATIONS

1. Obtain physical data from key spawning ground locations, including water temperature data and/or cross-sectional creek profiles, to ascertain whether temperature or bedload movement might be a factor in spawner distribution.

ACKNOWLEDGEMENTS

We wish to express our appreciation to the members of the A'Tlegay Fisheries Society who staffed and operated the fence and the carcass recoveries. Kim Duncan managed the project. Data compilation was performed by Casey Inrig. John Duncan and Andy Puglas managed the spring smolt enumeration program. Adult enumeration and sampling activities in the autumn were carried out by Shaun Inrig, Shane Pollard, Lloyd Henderson, Kim Inrig, Jack Duncan, Robbie Chickite, Bill Dick Jr., and Karl Smith.

Steve Baillie and J. Taylor provided access to Black Creek coho data reports (in prep.) for coho return years prior to 2006. The format of this report is based in part on templates provided by those authors.

LITERATURE CITED

Baillie, S.J., Simpson, K., and Taylor, J.A. 2004. Enumeration studies of coho salmon at Black Creek: 1995 adults and 1996 juveniles and adults. Can. Manuscr. Rep. Fish. Aquat. Sci. 2698: 49 p.

Brown, T.G., Barton, L., and Langford, G. 1996. The use of a geographic information system to evaluate terrain resource information management (TRIM) maps and to measure land use patterns for Black Creek, Vancouver Island. Can. Manuscr. Rep. Fish. Aquat. Sci. 2395: 34 p.

Brown, T.G., Barton, L., and Langford, G. 1999. Coho salmon habitat within Black Creek, Vancouver Island. Can. Tech. Rep. Fish. Aquat. Sci. 2294: 75 p.

Gazey, W.J., and Staley, M.J. 1986 Population estimation from mark-recapture experiments using sequential Bayes algorithm. Ecology. 67(4): 941-951.

Labelle, M. 1990. A comparative study of coho salmon populations of southeast Vancouver Island, British Columbia: Juvenile outmigration, coded-wire tagging and recovery, escapement enumeration and stock composition at Black Creek, Trent River, and French Creek, 1984-1988. Can. Tech. Rep. Fish. Aquat. Sci. 1722: 148 p.

Mundie, J.H. 1984. Stream indexing: its usefulness and limitations. Can. Tech. Rep Fish. Aquat. Sci. 1326: 43-48.

Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Bull. Fish. Res. Bd. of Canada #191.

Robson, D.S., and Regier, H.A. 1964. Sample size in Petersen mark-recapture experiments. Trans. Amer. Fish. Soc. 93: 215 – 226.

Taylor, J.A., Baillie, S.J., and Simpson, K. 2006. 1997 juvenile and adult enumeration studies of coho salmon at Black Creek, Vancouver Island. Can. Manuscr. Rep. Fish. Aquat. Sci. 2767: 38 p.

Taylor, J.A., Baillie, S.J., and Simpson, K. In prep. 2004 juvenile and adult enumeration studies of coho salmon at Black Creek, Vancouver Island. Can. Manuscr. Rep. Fish. Aquat. Sci. XXXX: X p.

Taylor, J.A., and Baillie, S.J. In prep. 2005 juvenile and adult enumeration of coho salmon at Black Creek, Vancouver Island. Can. Manuscr. Rep. Fish. Aquat. Sci. XXXX: X p.

Van Will, P., Stiff, H., Miyagi, E., and Duncan, K. 2010a. Enumeration of juvenile and adult coho salmon at Black Creek, Vancouver Island, 2006. Can. Manuscr. Rep. Fish. Aquat. Sci. 2928: 54 p.

Van Will, P., Stiff, H., Miyagi, E., and Duncan, K. 2010b. Enumeration of juvenile and adult coho salmon at Black Creek, Vancouver Island, 2007. Can. Manuscr. Rep. Fish. Aquat. Sci. 2942: 132 p.

William, J.E. 2000. The Coefficient of Condition of Fish. In: Schneider, James C. (ed.) 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

TABLES

Table 1. Environmental conditions during smolt fence operations, 2008.

Date	Water Temp (°C)	Water Temp (°C)	Air Temp (°C)	Water Level (cm)	Weather	Comments
1-Apr	4.7	5.8	9.0	73	Sunny	set trap at 1400hrs
2-Apr	5.3	5.8	9.5	73	Sunny	caught 2 coho smolts and 1 cut good shape
3-Apr	5.6	5.9	8.5	73	Cloudy	
4-Apr	6.2	5.9	8.6	74	Rainy	
5-Apr	6.5	6.5	6.6	77	Rainy	
6-Apr	6.3	6.2	7.6	97	Rainy	high water pull top panels to relieve pressure
7-Apr	6.8	6.4	6.0	90	Cloudy	
8-Apr	6.7	6.7	5.4	88	Rainy	
9-Apr	6.0	5.9	5.7	88	Sunny	
10-Apr	7.0	6.5	7.5	83	Cloudy	
11-Apr	7.9	7.0	7.2	79	Cloudy	Back to normal trapping
12-Apr	8.5	7.4	8.3	78	Cloudy	
13-Apr	8.9	8.6	7.4	86	Sunny	
14-Apr	8.7	8.4	8.3	74	Sunny	
15-Apr	8.5	8.1	8.6	70	Cloudy	
16-Apr	9.0	8.6	8.8	68	Cloudy	
17-Apr	8.9	8.0	7.5	68	Cloudy	
18-Apr	7.9	6.5	7.0	67	Cloudy	
19-Apr	6.7	5.9	4.2	66	Cloudy	
20-Apr	6.2	4.9	4.4	64	Sunny	
21-Apr	6.2	5.4	4.4	64	Sunny	
22-Apr	6.7	4.4	5.0	63	Sunny	
23-Apr	7.8	8.4	8.0	61	Sunny	
24-Apr	8.5	9.5	9.3	61	Cloudy	
25-Apr	8.6	8.5	9.0	61	Cloudy	
26-Apr	8.6	4.3	4.3	62	Sunny	
27-Apr	9.5	8.6	8.6	63	Rainy	
28-Apr	10.6	9.0	9.5	59	Cloudy	
29-Apr	9.7	7.3	7.3	60	Cloudy	
30-Apr	8.7	7.1	7.1	61	Sunny	
1-May	8.8	8.0	9.0	62	Sunny	
2-May	8.7	8.0	8.5	62	Rainy	
3-May	10.5	9.0	7.8	64	Cloudy	
4-May	10.6	8.8	8.3	64	Sunny	
5-May	12.1	9.0	9.5	62	Cloudy	
6-May	12.4	10.5	10.2	59	Sunny	
7-May	11.6	9.7	9.5	57	Sunny	
8-May	11.1	9.8	9.5	56	Cloudy	
9-May	10.9	9.9	9.0	55	Cloudy	
10-May	10.9	10.0	9.0	54	Cloudy	
11-May	10.8	10.2	9.3	53	Sunny	
12-May	9.8	8.8	9.9	52	Sunny	
13-May	9.6	9.8	8.8	54	Rainy	
14-May	10.0	9.9	10.4	57	Rainy	
15-May	12.0	10.8	12.9	60	Cloudy	
16-May	13.4	11.0	11.8	60	Sunny	
17-May	14.9	12.7	12.0	60	Sunny	
18-May	16.4	14.9	15.3	57	Sunny	
19-May	15.4	15.6	14.8	56	Rainy	
20-May	14.2	13.0	12.5	54	Sunny	

Date	Water Temp (°C)	Water Temp (°C)	Air Temp (°C)	Water Level (cm)	Weather	Comments
21-May	13.5	12.6	12.1	53	Sunny	
22-May	13.0	11.8	11.4	53	Cloudy	
23-May	13.6	12.0	13.0	52	Sunny	
24-May	15.7	12.1	16.0	51	Sunny	dam up fence with tarps and sand bags
25-May	15.4	13.8	15.4	50	Cloudy	
26-May	15.4	14.1	15.9	49.5	Cloudy	
27-May	15.5	14.2	13.3	58	Cloudy	water level up from rain
28-May	15.5	14.2	15.6	56	Cloudy	
29-May	15.4	13.8	14.7	56	Cloudy	lots of small fry
30-May	14.1	13.1	14.0	55	Cloudy	
31-May	14.1	12.6	13.0	54	Sunny	
1-Jun	14.0			54	Cloudy	
2-Jun	13.8			53		
3-Jun	12.7			53		
4-Jun	13.4					

Table 2. Scale age composition of Black Creek coho smolts sampled at the juvenile weir, April 2 – May 26th, 2008. Fully aged fish.

AGE COMPOSITION					
Species	**European**	**Gilbert-Rich**	**Brood Year**	**Frequency**	**Percent**
Coho	1.0	2_2	2006	318	74.5%
Coho	2.0	3_3	2005	109	25.5%
TOTALS				427	100.0%

Table 3. Scale age composition of Black Creek coho smolts sampled at the juvenile weir, April 2 – May 26th, 2008. Partially aged or un-aged fish.

PARTIAL AGES					
Coho	M0	0M	No Marine Annulus	157	100.0%
TOTALS				157	100.0%

UNAGED					
Coho		MF	Mixed Fish	1	6.3%
Coho		NS	No Structure	5	31.3%
Coho		UD	Upside Down scale	10	62.5%
TOTALS				16	100.0%

Table 4. Summary of coho smolt scale ages by sampling period, 2008.

Period	**Statistic**	**Scale Age**				
		N/A	**1.0**	**2.0**	**M0**	**Grand Total**
Period 1: Apr 2-20	Count	5	9	31	5	50
	Percent	10%	20%	60%	10%	100%
Period 2: Apr 20 - May 5	Count	3	33	49	15	100
	Percent	3%	33%	49%	15%	100%
Period 3: May 5 – 16	Count	0	192	26	82	300
	Percent	0%	64%	9%	27%	100%
Period 4: May 16-26	Count	8	84	3	55	150
	Percent	5%	56%	2%	37%	100%
Total Count		**16**	**318**	**109**	**157**	**600**
Total Percent		**2%**	**53%**	**18%**	**27%**	**100%**

Table 5. Summary of 2008 length (mm) and weight (g) at age of coho smolts.

Statistic	Smolt Age				
	1	2	M0	N/A	All
Count	318	109	157	16	600
Percent	74.5%	25.5%	-	-	100%
Lengths	317	109	157	16	599
Min Length	90	105	85	95	85
Mean Length	119	160	123	130	128
Max Length	180	255	215	185	255
SD Length	14	26	19	30	24
Weights	274	29	137	8	448
Min Weight	6.9	10.1	8.0	9.2	6.9
Mean Weight	16.7	21.5	17.6	13.0	17.3
Max Weight	40.4	48.0	87.5	17.1	87.5
SD Weight	6.0	8.0	8.3	2.7	7.0

Table 6. Length frequency of coho smolts by period, 2008.

Fork Length (mm)	Period 1	Period 2	Period 3	Period 4	Total
070 - 074	1				1
080 - 084	1				1
085 - 089				1	1
090 - 094			1	2	3
095 - 099	1			1	2
100 - 104		2	1	2	5
105 - 109	1	1	2	3	7
110 - 114	1	3	1	17	22
115 - 119	2	3	5	14	24
120 - 124	5	5	12	14	36
125 - 129	3	7	23	12	45
130 - 134	5	16	19	2	42
135 - 139	2	8	11	5	26
140 - 144	4	5	5	14	28
145 - 149	3	3	4	5	15
150 - 154	1		3	4	8
155 - 159		3	1	2	6
160 - 164	7	8	1	1	17
165 - 169	12	4	4		20
170 - 174	15	13	3	1	32
175 - 179	11	5	1		17
180 - 184	13	6			19
185 - 189	7	5	1		13
190 - 194	4	2	1		7
195 - 199	1				1
> 200		1			1
All	**100**	**100**	**100**	**100**	**400**

Table 7. Size statistics for coho smolts by sampling period, 2008.

Period	**N**	**Fork Length (mm)**				**Fresh Weight (g)**			
		Min	**Mean**	**Max**	**Mode**	**Min**	**Mean**	**Max**	**Std**
1	100	70	159.5	195	170-174	4.9	38.1	76.3	17.4
2	100	101	148.5	200	130-134	13.0	35.0	77.6	15.0
3	100	92	135.0	255	125-129	11.0	28.5	155.3	16.7
4	100	85	124.5	170	110-114	7.3	21.2	49.9	7.8
ALL	**400**	**70**	**141.9**	**255**	**125-129**	**4.9**	**30.7**	**155.3**	**16.1**

Table 8. Summary of catches and coded-wire tag releases of coho smolts by tag series and sampling date, 2008.

Date	CWT Code	Pre-Morts	Number Tagged	Post Morts	Unmarked Releases	Pin Retention Test Fish	Number of Non-Retentions	24 hr Tag Loss	Effective CWTs	No pin fish	Comments
18-Apr	18-59-40	0	9	0					9	0	
21-Apr	18-59-40	0	15	0					15	0	
25-Apr	18-59-40	0	62	0					61	1	
28-Apr	18-59-40	0	123	0					121	2	
29-Apr	18-59-40	0	120	0					118	2	
1-May	18-59-40	0	395	0		83	1	1.2%	389	6	first 24-hr retention test
2-May	18-59-40	0	422	0					416	6	
3-May	18-59-40	0		0					0	0	
4-May	18-59-40	0		0					0	0	
5-May	18-59-40	486	31	0					31	0	
6-May	18-59-40	0	1,164	0					1,146	18	
7-May	18-59-40	0	1,083	0		100	2	2.0%	1,066	17	2nd 24-hr retention test
8-May	18-59-40	2	1,216	0					1,197	19	
9-May	18-59-40	0	1,105	0					1,088	17	**5,745 CWT on 18-59-40**
9-May	18-59-41	0	43	0					42	1	
10-May	18-59-41	0	843	0		100	1	1.0%	830	13	3rd 24-hr retention test
11-May	18-59-41	0	95	0					94	1	
16-May	18-59-41	0	1,088	0					1,071	17	
17-May	18-59-41	0	1,141	0					1,124	17	
20-May	18-59-41	0	1,027	0		100	2	2.0%	1,011	16	4th 24-hr retention test
31-May	18-59-41	0	348	0					343	5	
1-Jun	18-59-41	0	98	0					97	1	**4,683 CWT on 18-59-41**
TOTALS		**499**	**10,428**	**2**	**23,773**	**383**	**6**	**1.5%**	**10,269**	**159**	

Table 9. Daily upstream migration through the adult counting fence, 2008.

Date	Coho			Chum	Chin-ook	Cut-throat	Other	Comment
	Adults	Jacks	Unknown					
07-Oct	9	17		0	0	0		
08-Oct	0	1		0	0	1		
09-Oct	0	0		0	0	0		
10-Oct	0	0		0	0	0		
11-Oct	0	0		0	0	0		
12-Oct	0	0		0	0	0		
13-Oct	0	0		0	0	0		
14-Oct	0	0		0	0	0		
15-Oct	0	0		0	0	0		
16-Oct	0	0		0	0	0		
17-Oct	63	133		0	0	16		
18-Oct	3	0		0	0	0		
19-Oct	0	0		0	0	0		
20-Oct	0	0		1	0	0		
21-Oct	0	0		0	0	0		
22-Oct	0	0		0	0	0		
23-Oct	0	0		0	0	0		
24-Oct	0	0		0	0	0		
25-Oct	0	0		0	0	0		
26-Oct	0	0		0	0	0		
27-Oct	0	0		0	0	0		
28-Oct	0	0		0	0	0		
29-Oct	0	0		0	0	0		
30-Oct	0	0		0	0	0		
31-Oct	109	86	1	3	0	7		
01-Nov	140	62		1	0	2		
02-Nov	220	20		0	0	0		
03-Nov	185	6		0	0	0		
04-Nov	29	0		0	0	0		
05-Nov	4	0		0	0	0		
06-Nov	20	12		2	1	0		
07-Nov	21	36	1	0	0	1		
08-Nov	20	4	16	0	0	0		16 coho not sampled
09-Nov	34	19		0	0	0		2 panels open over night
10-Nov	21	35		1	0	0		
11-Nov	12	5	1	0	0	5		
12-Nov	5	7		0	0	0		
13-Nov	3	1		1	0	0		
14-Nov	0	0		0	0	0		
15-Nov	0	0		0	0	0		
16-Nov	0	0		0	0	0		
TOTAL	891	444	19	9	1	32	0	TOTAL COHO: 1,354 TOTAL FISH: 1,396

Table 10. Relative condition of maturity of Black Creek coho as assessed subjectively at the counting fence, 2008.

Condition	Females	Males	Jacks	Unknown	All
Silver	38	11	47		96
Green	287	179	343	1	810
Mature	175	201	53		429
Ripe	0	0	0		0
Unknown			1	18	19
Total	**500**	**391**	**444**	**19**	**1,354**

Table 11. Summary of coho adult scale ages.

Period	Data	Scale Age					Grand Total
		1.1	2.1	M1[7]	RG[8]	UD[9]	
Oct 7 – Nov 10	Count	38	5	41	1	4	89
	Percent of Scales	43%	6%	46%	1%	4%	100%
	Pct of Fully Aged Scales	**88%**	**12%**				100%

Table 12. Age and sex composition for adult coho, 2008.

Sex	Statistic	1.1	2.1	Grand Total
F	Count	23	5	28
	Percent	53.5%	11.6%	65.1%
M	Count	15	0	15
	Percent	34.9%	0.0%	34.9%
Total Count		**38**	**5**	**43**
Total Percent		**88.4%**	**11.6%**	**100%**

---

[7] 1 marine annulus.
[8] Regenerated.
[9] Upside-down.

Table 13. Fork length (cm) frequency distribution data for adult and jack coho[10], 2008.

Fork Length Range (cm)	Females	Males	Jacks	Total
11 to 15	0	0	0	0
16 to 20	0	0	0	0
21 to 25	0	0	4	4
26 to 30	0	0	97	97
31 to 35	0	0	172	172
36 to 40	1	0	157	158
41 to 45	1	0	14	15
46 to 50	3	1	0	4
51 to 55	11	3	0	14
56 to 60	24	14	0	38
61 to 65	49	19	0	68
66 to 70	109	53	0	161
71 to 75	173	89	0	262
76 to 80	112	124	0	236
81 to 85	17	75	0	92
86 to 90	0	12	0	12
91 to 95	0	0	0	0
96 to 100	0	0	0	0
Total	**500**	**390**	**444**	**1,334**

Table 14. Statistical summary of fork length (cm) data for adult and jack coho[11], 2008.

Statistic	Females	Males	Jacks	Unknown	All
Count	500	390	444	3	1,337
Minimum	40.0	49.0	24.0	61.0	24.0
Mean	**71.1**	**75.0**	**33.9**	**61.0**	**59.8**
Maximum	84.0	89.0	43.0	61.0	89.0
Std Deviation	6.7	6.9	4.0	-	19.4

Table 15. Length-at-age for aged adult coho, 2008.

Sex	Fork Length (cm)	1.1	2.1	All Ages
F	Count	23	5	28
	Mean	**68.6**	**74.2**	**69.6**
	Std Deviation	6.6	3.3	6.5
M	Count	15	0	15
	Mean	**71.2**		**71.2**
	Std Deviation	12.4		12.4
Total Count		38	5	43
Overall Average		**69.6**	**74.2**	**70.2**
Standard Deviation		9.3	3.3	8.9

---

[10] Excludes sixteen un-sampled coho, three un-sexed coho, and one un-sized male coho.

[11] Excludes sixteen un-sampled coho, one un-sized male coho.

Table 16. Summary of coded-wire tag detections during coho movement through the counting fence, 2008.

Sex	CWT present	CWT absent	Not checked[12]	Total
F	35	455	10	500
M	23	357	11	391
J	8	369	67	444
Unknown	0	1	18	19
Total	**66**	**1,182**	**106**	**1,354**

Table 17. Summary of coho adult and jack tag operations at the counting fence, 2008.

	Females	Males	Jacks	Unknown	All
Captured	**500**	**391**	**444**	**19**	**1,354**
Not Tagged	5	6	442	19	472
Clear Tags	101	59	0	0	160
Yellow Tags	394	326	2	0	722
Total Tags	**495**	**385**	**2**	**0**	**882**

Table 18. Summary of recoveries of coho from spawning ground sampling sites, 2008.

Reach (#) & Location Found	Unmarked					Marked				Total
	F	J	M	Unk	Total	F	M	Unk	Total	
(1) Above Fence						2			2	2
(1) Below Fence	5	1	4		10					10
(2) Below Hwy.						2			2	2
(3) Above Hwy.						1	1		2	2
(3) Kelland Bridge	1		1		2					2
(4) Below Isl. Hwy.	1				1					1
(4) Keddy Creek			2		2	1	1		2	4
(5) Above new Hwy.						1		1	2	2
(5) Miller Creek	1				1	1			1	2
(5) Sayer Creek						1	2		3	3
(7) Logging bridge to new Hwy & below Duncan Bay Main Bridge						2	3		5	5
(8) Below Logging Bridge			4		4					4
(8) Bottom Fork		1			1	5	3		8	9
(8) Duncan Bay Main Bridge						2	4		6	6
Unspecified	12	3	13	2	30	62	48		110	140
Grand Total	**20**	**5**	**24**	**2**	**51**	**80**	**62**	**1**	**143**	**194**

---

[12] Some fish were not examined for CWT tags at the fence.

Table 19. Summary of adult coho recoveries by date, sex, and mark presence (N=No, Y=Yes) on the Black Creek watershed spawning grounds, 2008.

Date	Females			Males			Jacks	Sex Unknown			Grand Total
	N	Y	Total	N	Y	Total	N	N	Y	Total	
14-Nov-08		6	6		6	6	1				13
15-Nov-08		2	2		3	3					5
16-Nov-08	2	10	12	5	10	15	1	2		2	30
17-Nov-08		3	3		1	1					4
18-Nov-08		2	2		3	3					5
19-Nov-08	3	3	6	2		2	1				9
20-Nov-08	1	8	9	2	3	5	1				15
21-Nov-08	1	1	2	2		2					4
22-Nov-08	1		1		1	1					2
23-Nov-08	6	5	11	7	4	11					22
24-Nov-08	3	10	13	1	10	11	1				25
25-Nov-08		5	5	2	2	4					9
26-Nov-08	2	6	8	1	6	7					15
28-Nov-08		6	6		2	2					8
30-Nov-08		1	1						1	1	2
1-Dec-08		2	2		3	3					5
3-Dec-08		2	2	1	2	3					5
4-Dec-08	1	1	2								2
5-Dec-08		2	2	1	2	3					5
6-Dec-08		2	2		4	4					6
8-Dec-08		3	3								3
Total	**20**	**80**	**100**	**24**	**62**	**86**	**5**	**2**	**1**	**3**	**194**

Table 20. Mark application and recovery by sex for the 2008 Black Creek coho escapement, comparing recovery rates for T-bar tagged versus left opercular-punched fish.

Sex	Marks Applied		Marks Recovered			% Recovery		
	T-Bar[13]	L-Punch	T-Bar	L-Punch[14]	Marked[15]	T-Bar	L-Punch	Marked
M	385	385	35	56	62	9.1%	14.5%	16.1%
F	495	495	46	71	80	9.3%	14.3%	16.2%
J	2	2	0	0	0	0.0%	0.0%	0.0%
Unknown Adult[16]	0	0	0	1	1	0.0%	0.1%	0.7%
Total Adult	**880**	**880**	**81**	**128**	**143**	**9.2%**	**14.5%**	**16.3%**

---

[13] All fish caught at the fence had a T-Bar tag applied and a left opercular hole-punch.

[14] Recoveries with left opercular punch only (no T-Bar tag).

[15] All fish marked with either T-bar tag or left opercular punch.

[16] Sex was not determined or reported.

Table 21. Petersen mark/recapture escapement estimation based on Black Creek adult coho marked fish and recoveries.

Adults	
Marks	880
Captures	194
Recoveries	143
R/C	74%

Petersen Pop Estimator	Pop	Var	Std Dev
Hypergeometric	1,192.02	2,162.52	46.50
Binomial	1,191.67	2,561.40	50.61
Inverse Hypergeometric	1,194.20		
Inverse Binomial	1,193.85	2601.972	51.01

Table 22. Black Creek adult coho marks and recoveries, by date of recapture, for Bayesian escapement population estimation.

Date	Time Interval (T)	Catch (C)	Marks Available (M)	Recovered Marks (R)
14-Nov-08	1	13	880	12
15-Nov-08	2	5	868	5
16-Nov-08	3	30	863	20
17-Nov-08	4	4	843	4
18-Nov-08	5	5	839	5
19-Nov-08	6	9	834	3
20-Nov-08	7	15	831	11
21-Nov-08	8	4	820	1
22-Nov-08	9	2	819	1
23-Nov-08	10	22	818	9
24-Nov-08	11	25	809	20
25-Nov-08	12	9	789	7
26-Nov-08	13	15	782	12
27-Nov-08	14	0	770	0
28-Nov-08	15	8	770	8
29-Nov-08	16	0	762	0
30-Nov-08	17	2	762	2
1-Dec-08	18	5	760	5
2-Dec-08	19	0	755	0
3-Dec-08	20	5	755	4
4-Dec-08	21	2	751	1
5-Dec-08	22	5	750	4
6-Dec-08	23	6	746	6
7-Dec-08	24	0	740	0
8-Dec-08	25	3	740	3
Total		194		143

Table 23. Bayesian posterior probability distribution statistics for Black Creek adult coho population estimate, 2008.

```
                           Weighted Moments

N                              1001    Sum Weights           0.99999965
Mean                     1130.60984    Sum Observations      1130.60944
Std Deviation            1.55567555    Variance              2.42012641
Skewness                 0.07232002    Kurtosis              -0.8513676
Uncorrected SS           1280698.28    Corrected SS          2420.12641
Coeff Variation          0.13759614    Std Error Mean        1.55567582


                Weighted Basic Statistical Measures

        Location                    Variability

    Mean     1130.610     Std Deviation                1.55568
    Median   1127.000     Variance                     2.42013
    Mode      .           Range                      500.00000
                          Interquartile Range         65.50000


                 Weighted Tests for Location: Mu0=0

        Test           -Statistic-     -----p Value------

        Student's t    t  726.7644     Pr > |t|    <.0001


                         Weighted Quantiles

                       Quantile        Estimate

                       100% Max          1500.0
                       99%               1260.5
                       95%               1217.0
                       90%               1195.5
                       75% Q3            1161.5
                       50% Median        1127.0
                       25% Q1            1096.0
                       10%               1070.0
                       5%                1056.0
                       1%                1031.5
                       0% Min            1000.0


                        Extreme Observations

             -----Lowest-----          -----Highest----

              Value      Obs            Value      Obs

             1000.0    24025           1498.0    25021
             1000.5    24026           1498.5    25022
             1001.0    24027           1499.0    25023
             1001.5    24028           1499.5    25024
             1002.0    24029           1500.0    25025
```

Table 24. Estimated marine survival and associated exploitation rate in marine fisheries, 1976-2008.

Return Year	Smolt to Adult Survival Rate	Exploitation Rate
1976	0.190[1]	0.915[2]
1977	0.198[1]	0.836[2]
1978 - 1985	-	-
1986	0.125	0.727
1987	0.115	0.847
1988	0.134	0.676
1989	0.115	0.697
1990	0.129	0.713
1991	0.080	0.677
1992	0.125	0.767
1993	0.054	0.739
1994	0.059	0.790
1995	0.045	0.567
1996	0.034	0.703
1997	0.049	0.541
1998	0.045	0.030
1999	0.017	0.030
2000	0.022	0.030
2001	0.074	0.046
2002	0.049	0.059
2003	0.030	0.043
2004	0.044	0.043
2005	0.013	0.044
2006	0.015	0.044
2007	0.026	0.042
2008	0.008	0.058

---

[1] Probable under-estimate due to probable under-estimate of escapement.

[2] Probable over-estimate due to probable under-estimate of escapement

FIGURES

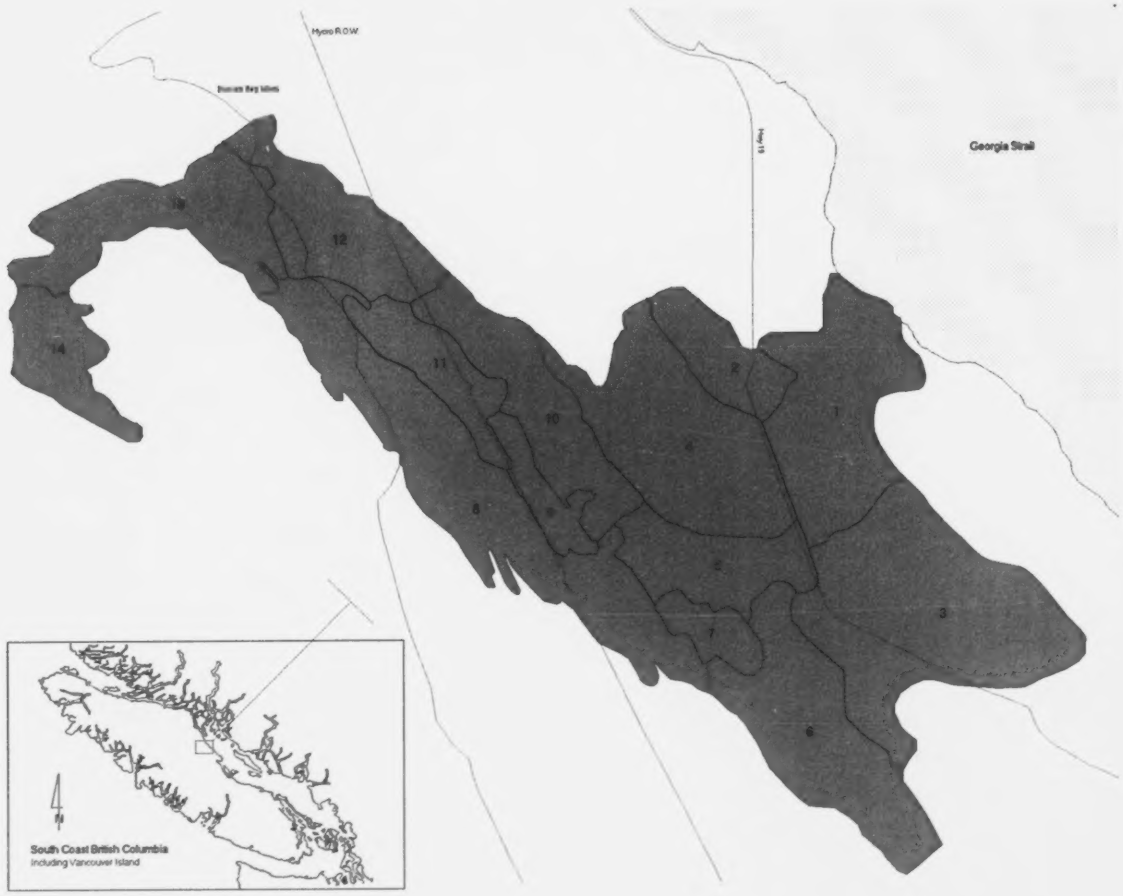
Hydro R.O.W.
Hwy 19
Georgia Strait
13
12
14
11
10
2
1
4
9
8
5
7
3
6
N
South Coast British Columbia
Including Vancouver Island

Figure 1. The Black Creek watershed and sub-basin boundaries (after Brown et al. 1999).

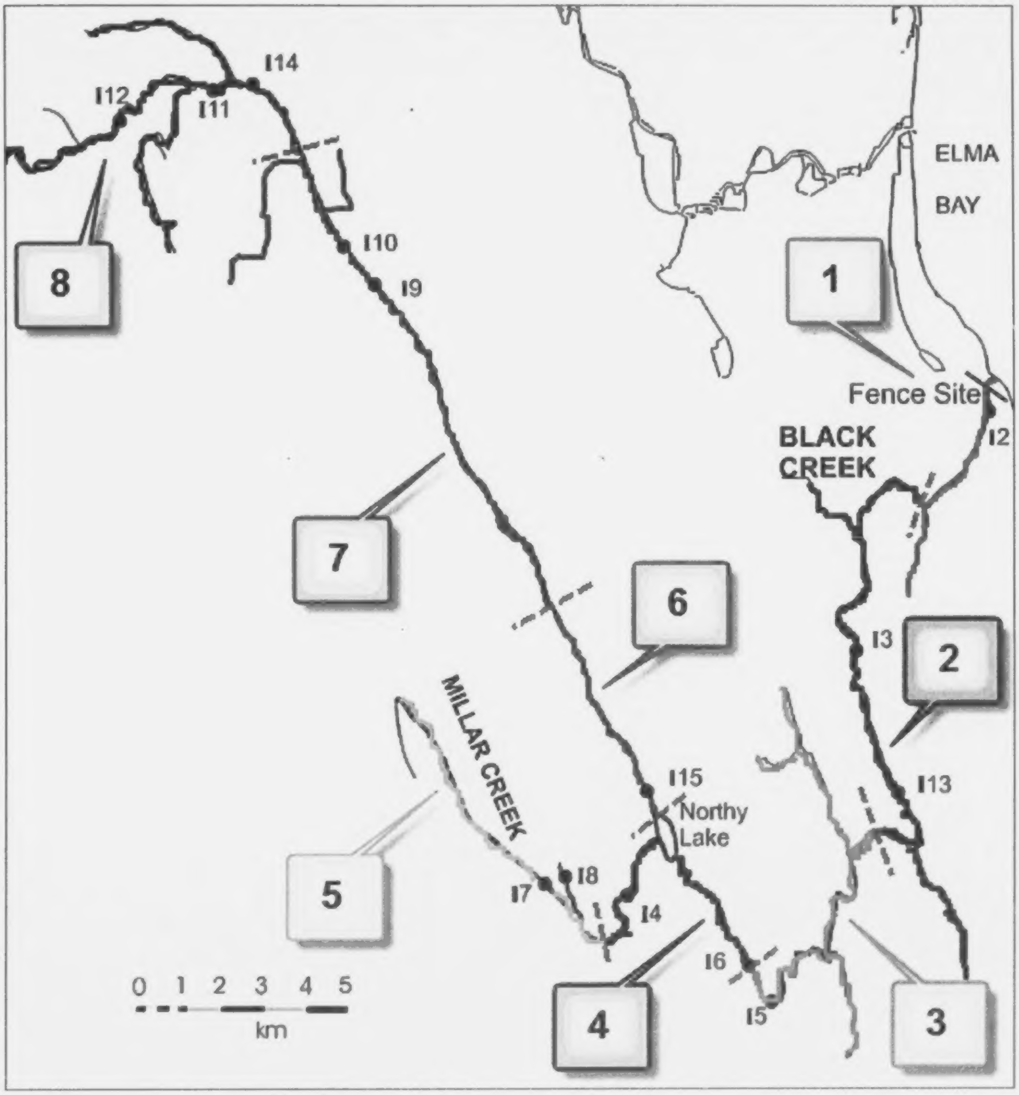
I14
I12
I11
ELMA
BAY
I10
I9
8
1
Fence Site
BLACK
CREEK
I2
7
6
I3
2
MILLAR CREEK
I15
I13
Northy
Lake
5
I8
I7
I4
0 1 2 3 4 5
km
I6
4
I5
3

Figure 2. The Black Creek system, showing the locations of the fence and recovery sampling sites, by reach.

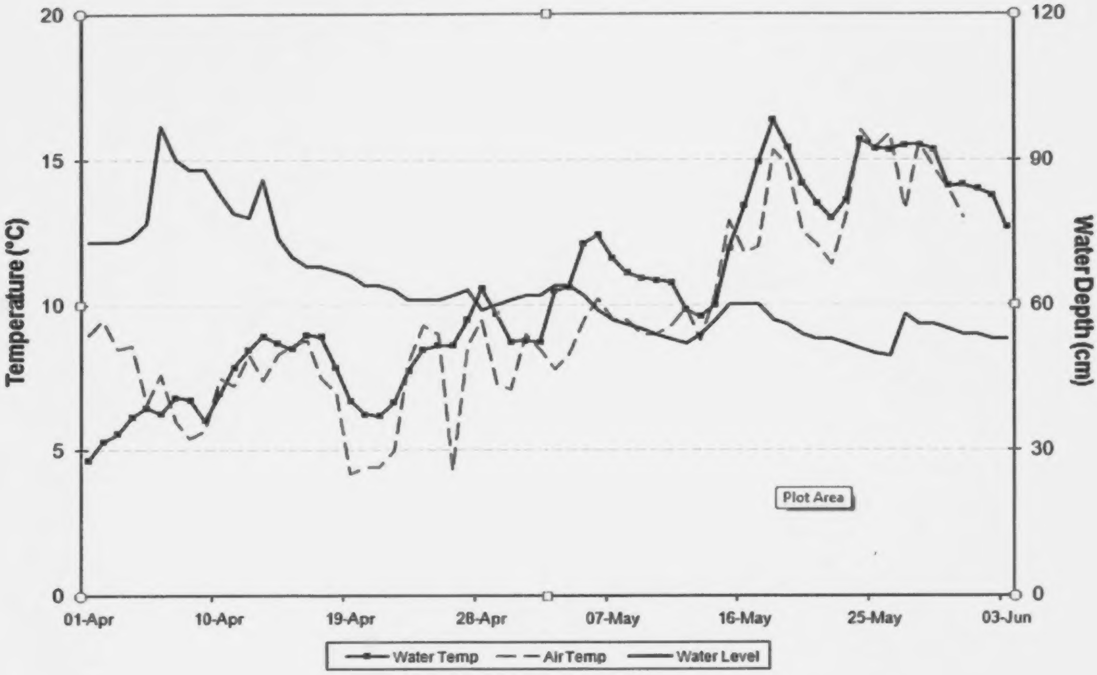

Figure 3. Black Creek water level and temperature during the 2008 smolt outmigration period.

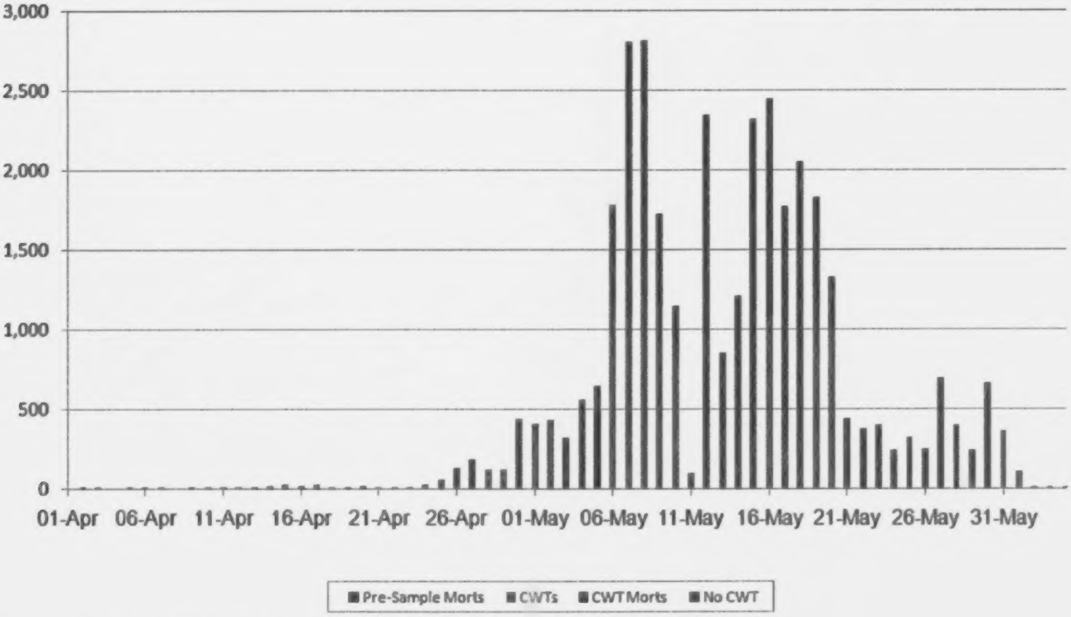

Figure 4. 2008 Black Creek daily coho smolt out-migration.

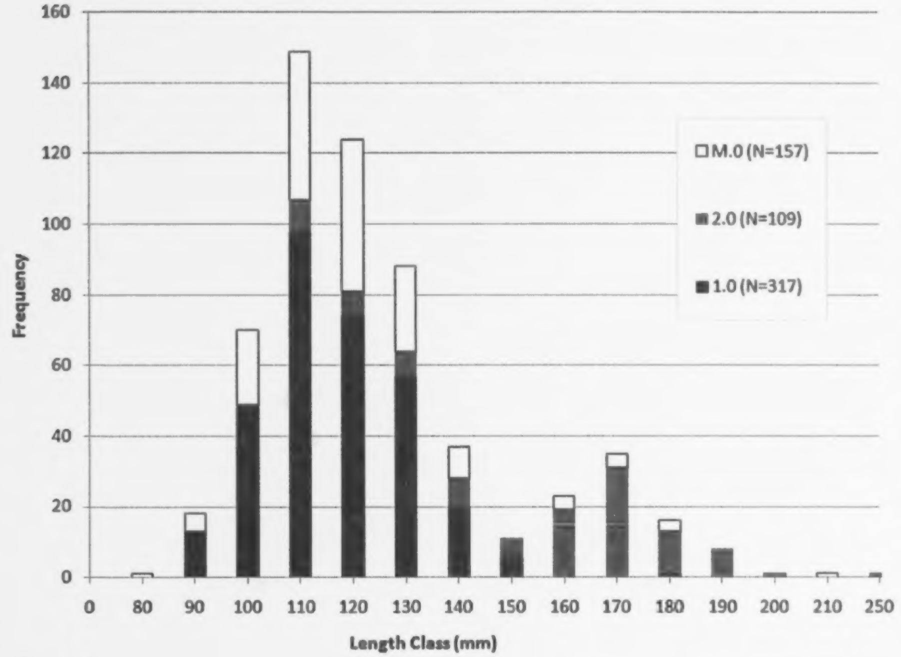

Figure 5. Smolt length frequency by age class (N=583). X-axis value represents low end of category (e.g., Length Class "100" represents fish 100-109 mm).

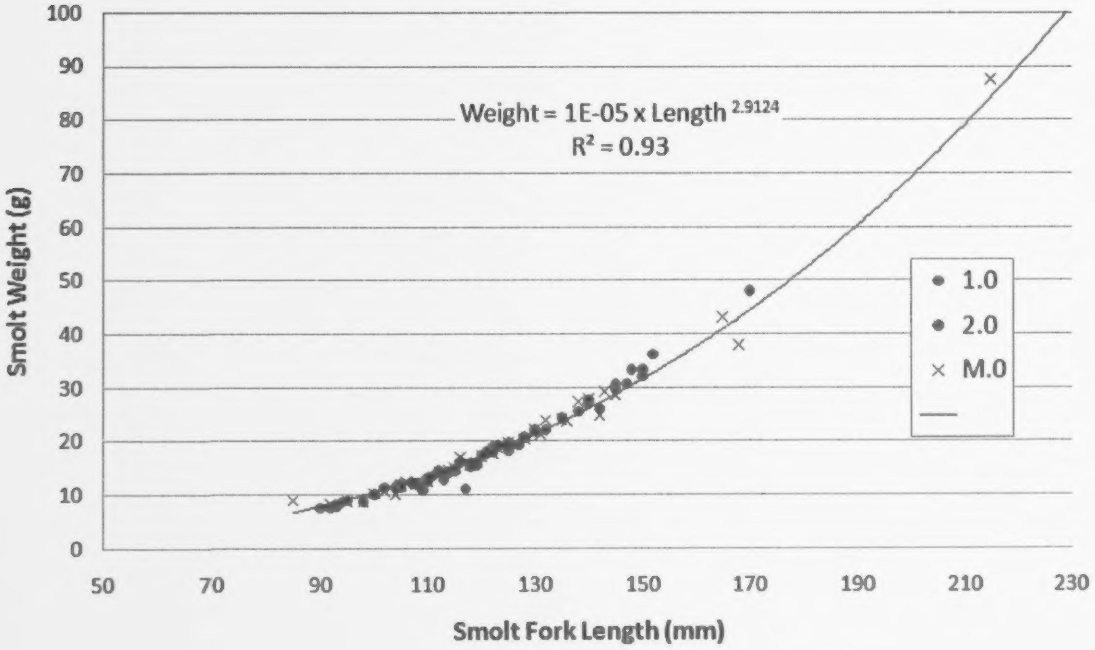

Figure 6. Black Creek coho smolts length-weight relationship, (N = 448).

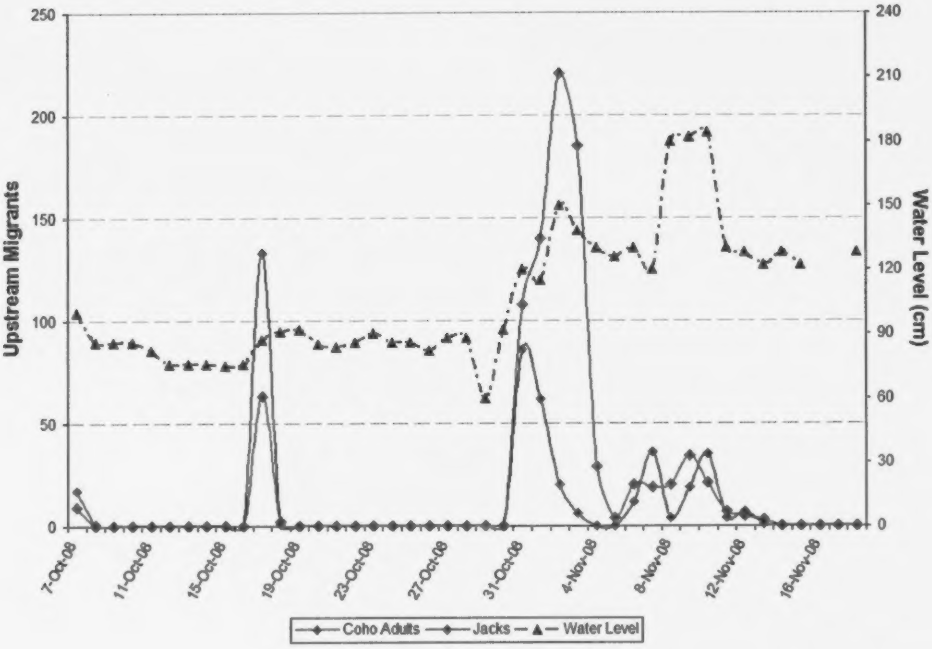

Figure 7. Adult and jack coho escapement and corresponding water levels, 2008.

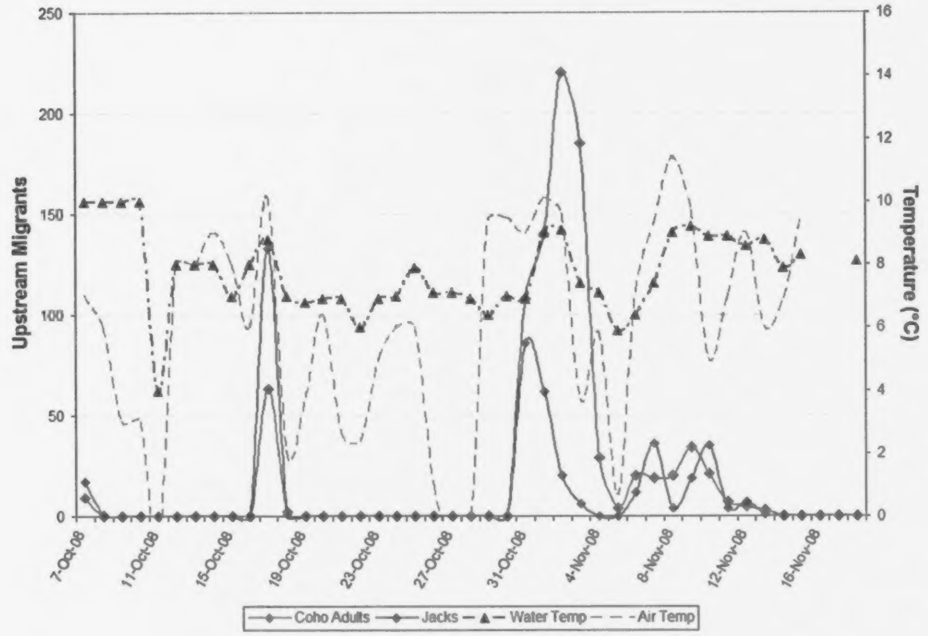

Figure 8. Air and water temperature time-series during adult migration period, 2008.

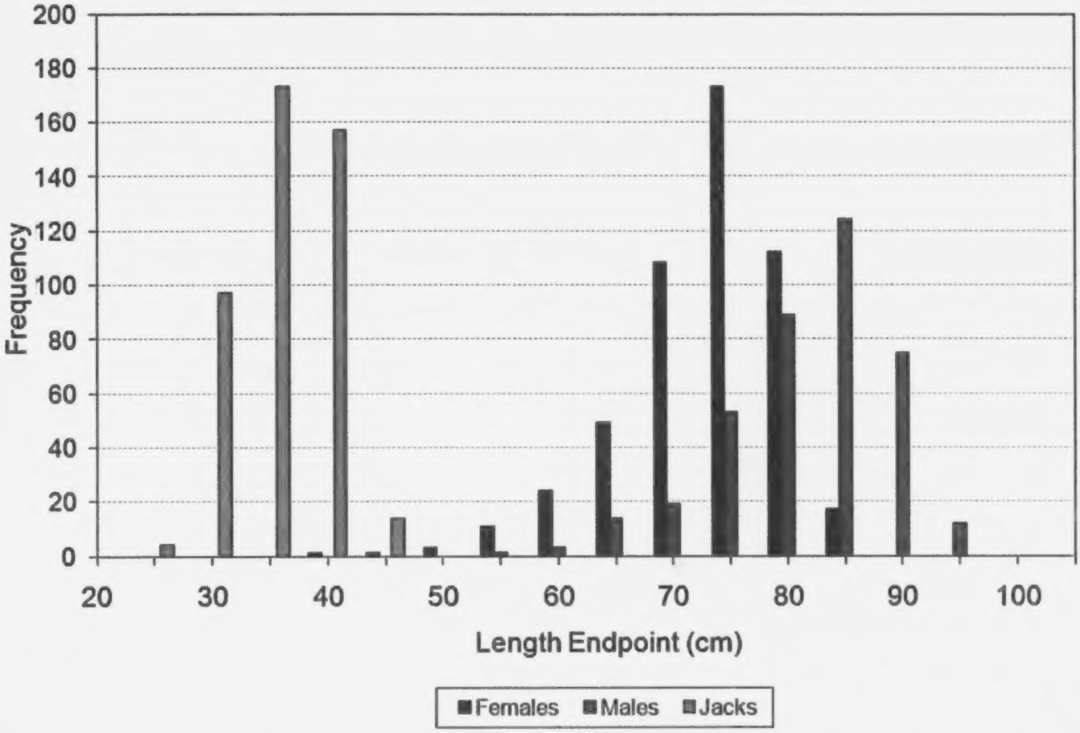

Figure 9. Length-frequency distribution of coho adults and jacks, 2008.

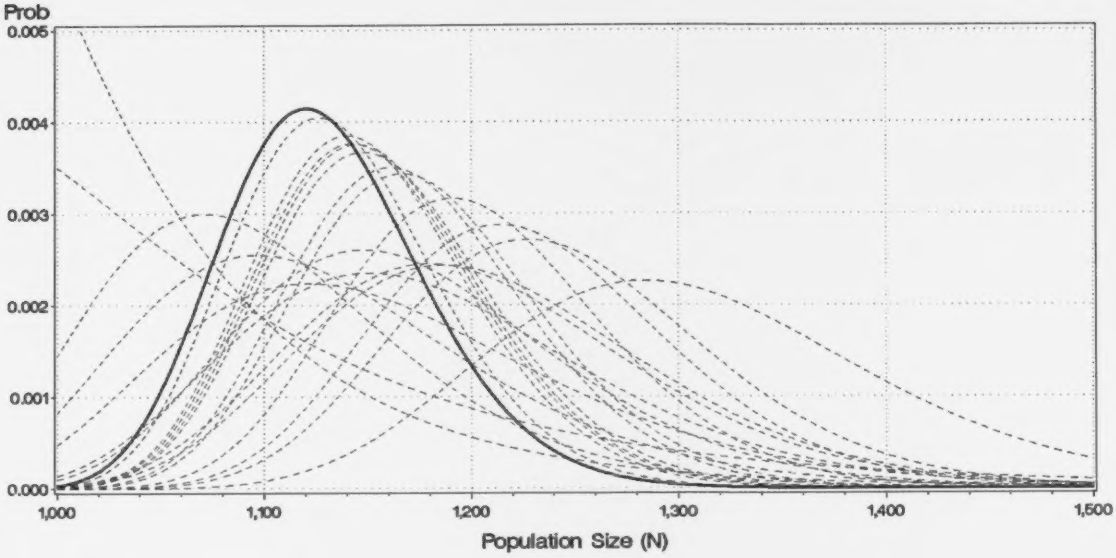

Figure 10. Sequential plots of the posterior distribution of the Bayesian population estimate for 2008 coho adults from marked releases. Final sequence is depicted by solid line. Modal estimate is 1,120 adults (95% confidence range: 1,056 – 1,217).

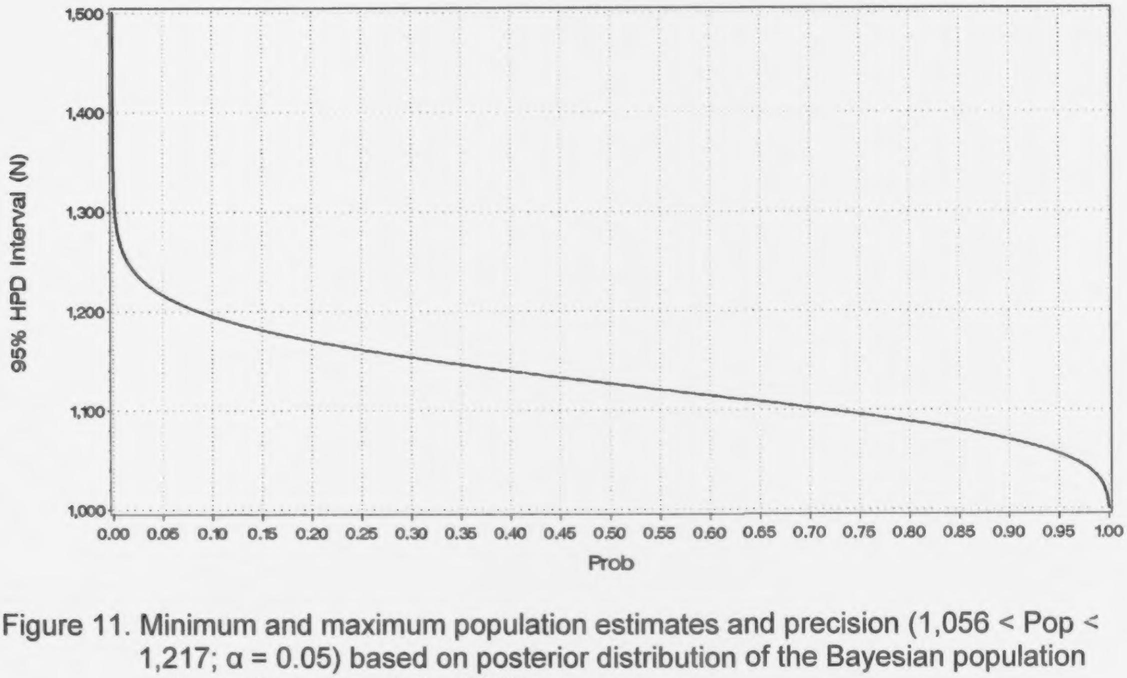

Figure 11. Minimum and maximum population estimates and precision (1,056 < Pop < 1,217; α = 0.05) based on posterior distribution of the Bayesian population estimate for coho adults, 2008.

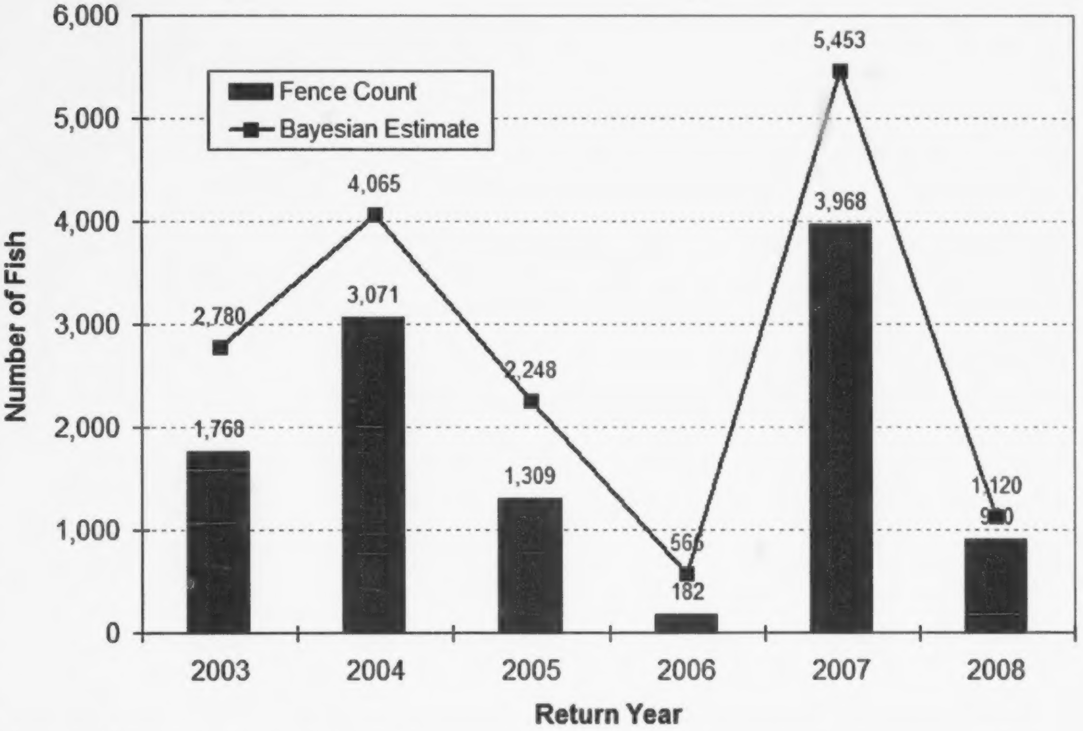

Figure 12. Black Creek adult coho fence counts and Bayesian population estimates, 2003-2008.

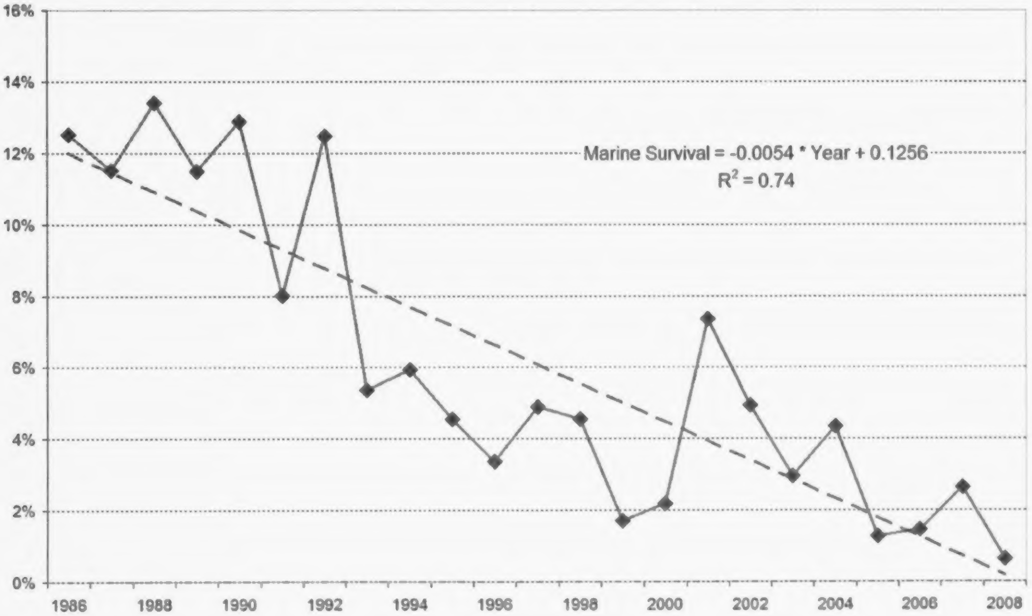

Figure 13. Trend in Black Creek adult coho marine survival, by return year, 1986-2008.

Left Blank on Purpose

APPENDICES

Appendix A. Daily water level and temperature during the 2008 spring outmigration.

Date	Day	Water Temp[17]	Water Temp[18]	Air Temp[19]	Water Level[20]	Weather	Comments
1-Apr	Tue	4.7	5.8	9.0	73	Sunny	set trap at 1400hrs
2-Apr	Wed	5.3	5.8	9.5	73	Sunny	caught 2 coho smolts and 1 cut good shape
3-Apr	Thu	5.6	5.9	8.5	73	Cloudy	
4-Apr	Fri	6.2	5.9	8.6	74	Rainy	
5-Apr	Sat	6.5	6.5	6.6	77	Rainy	
6-Apr	Sun	6.3	6.2	7.6	97	Rainy	high water pull top panels to relieve pressure
7-Apr	Mon	6.8	6.4	6.0	90	Cloudy	
8-Apr	Tue	6.7	6.7	5.4	88	Rainy	
9-Apr	Wed	6.0	5.9	5.7	88	Sunny	
10-Apr	Thu	7.0	6.5	7.5	83	Cloudy	
11-Apr	Fri	7.9	7.0	7.2	79	Cloudy	Back to normal trapping
12-Apr	Sat	8.5	7.4	8.3	78	Cloudy	
13-Apr	Sun	8.9	8.6	7.4	86	Sunny	
14-Apr	Mon	8.7	8.4	8.3	74	Sunny	
15-Apr	Tue	8.5	8.1	8.6	70	Cloudy	
16-Apr	Wed	9.0	8.6	8.8	68	Cloudy	
17-Apr	Thu	8.9	8.0	7.5	68	Cloudy	
18-Apr	Fri	7.9	6.5	7.0	67	Cloudy	
19-Apr	Sat	6.7	5.9	4.2	66	Cloudy	
20-Apr	Sun	6.2	4.9	4.4	64	Sunny	
21-Apr	Mon	6.2	5.4	4.4	64	Sunny	
22-Apr	Tue	6.7	4.4	5.0	63	Sunny	
23-Apr	Wed	7.8	8.4	8.0	61	Sunny	
24-Apr	Thu	8.5	9.5	9.3	61	Cloudy	
25-Apr	Fri	8.6	8.5	9.0	61	Cloudy	
26-Apr	Sat	8.6	4.3	4.3	62	Sunny	
27-Apr	Sun	9.5	8.6	8.6	63	Rainy	
28-Apr	Mon	10.6	9.0	9.5	59	Cloudy	
29-Apr	Tue	9.7	7.3	7.3	60	Cloudy	
30-Apr	Wed	8.7	7.1	7.1	61	Sunny	
1-May	Thu	8.8	8.0	9.0	62	Sunny	

---

[17] Daily mean water temperature (ºC) from hourly Tidbit data logger samples upstream of fence.

[18] Spot water temperature sample (ºC) taken at staff gauge or fence at about 8 a.m.

[19] Spot air temperature sample (ºC) taken at staff gauge or fence at about 8 a.m.

[20] Centimeters.

Date	Day	Water Temp[17]	Water Temp[18]	Air Temp[19]	Water Level[20]	Weather	Comments
2-May	Fri	8.7	8.0	8.5	62	Rainy	
3-May	Sat	10.5	9.0	7.8	64	Cloudy	
4-May	Sun	10.6	8.8	8.3	64	Sunny	
5-May	Mon	12.1	9.0	9.5	62	Cloudy	
6-May	Tue	12.4	10.5	10.2	59	Sunny	
7-May	Wed	11.6	9.7	9.5	57	Sunny	
8-May	Thu	11.1	9.8	9.5	56	Cloudy	
9-May	Fri	10.9	9.9	9.0	55	Cloudy	
10-May	Sat	10.9	10.0	9.0	54	Cloudy	
11-May	Sun	10.8	10.2	9.3	53	Sunny	
12-May	Mon	9.8	8.8	9.9	52	Sunny	
13-May	Tue	9.6	9.8	8.8	54	Rainy	
14-May	Wed	10.0	9.9	10.4	57	Rainy	
15-May	Thu	12.0	10.8	12.9	60	Cloudy	
16-May	Fri	13.4	11.0	11.8	60	Sunny	
17-May	Sat	14.9	12.7	12.0	60	Sunny	
18-May	Sun	16.4	14.9	15.3	57	Sunny	
19-May	Mon	15.4	15.6	14.8	56	Rainy	
20-May	Tue	14.2	13.0	12.5	54	Sunny	
21-May	Wed	13.5	12.6	12.1	53	Sunny	
22-May	Thu	13.0	11.8	11.4	53	Cloudy	
23-May	Fri	13.6	12.0	13.0	52	Sunny	
24-May	Sat	15.7	12.1	16.0	51	Sunny	dam up fence with tarps and sand bags
25-May	Sun	15.4	13.8	15.4	50	Cloudy	
26-May	Mon	15.4	14.1	15.9	49.5	Cloudy	
27-May	Tue	15.5	14.2	13.3	58	Cloudy	water level up from rain
28-May	Wed	15.5	14.2	15.6	56	Cloudy	
29-May	Thu	15.4	13.8	14.7	56	Cloudy	lots of small fry
30-May	Fri	14.1	13.1	14.0	55	Cloudy	
31-May	Sat	14.1	12.6	13.0	54	Sunny	
1-Jun	Sun	14.0			54	Cloudy	
2-Jun	Mon	13.8			53		
3-Jun	Tue	12.7			53		
4-Jun	Wed	13.4					End of survey

Appendix B. Daily catch of coho smolts and fry at the Black Creek fence, 2008.

Date[21]	Total Trap Smolts	Pre-Sample Morts	CWT Releases	CWT Morts	Not CWT'd	Total Smolts Release	% CWT	Total Trap Fry Released
1-Apr-08	0				0	0		
2-Apr-08	2				2	2	0%	
3-Apr-08	4				4	4	0%	
4-Apr-08	0				0	0		
5-Apr-08	10	2			8	8	0%	
6-Apr-08	8	4			4	4	0%	
7-Apr-08	2				2	2	0%	
8-Apr-08	0				0	0		
9-Apr-08	3				3	3	0%	
10-Apr-08	1	0			1	1	0%	
11-Apr-08	5	0			5	5	0%	
12-Apr-08	4	2			2	2	0%	2
13-Apr-08	7	0			7	7	0%	2
14-Apr-08	22	0			22	22	0%	
15-Apr-08	26	3			23	23	0%	
16-Apr-08	22	0			22	22	0%	
17-Apr-08	27	0			27	27	0%	
18-Apr-08	9	0	9			9	100%	
19-Apr-08	8				8	8	0%	
20-Apr-08	19				19	19	0%	
21-Apr-08	15		15			15	100%	
22-Apr-08	4				4	4	0%	
23-Apr-08	7				7	7	0%	
24-Apr-08	30				30	30	0%	
25-Apr-08	62		62			62	100%	
26-Apr-08	133				133	133	0%	
27-Apr-08	182				182	182	0%	
28-Apr-08	123		123			123	100%	3
29-Apr-08	120		120			120	100%	15
30-Apr-08	444				444	444	0%	8
1-May-08	403		395	2	8	403	98%	32
2-May-08	426		422		4	426	99%	25
3-May-08	323				323	323	0%	20
4-May-08	559				559	559	0%	21
5-May-08	643	486	31		126	157	20%	
6-May-08	1,783	0	1,164		619	1,783	65%	
7-May-08	2,811	0	1,083		1,728	2,811	39%	98
8-May-08	2,816	2	1,216		1,598	2,814	43%	33
9-May-08	1,729	0	1,148		581	1,729	66%	23
10-May-08	1,148		843		305	1,148	73%	15

---

[21] For date-specific comments, see Appendix C.

Date[21]	Total Trap Smolts	Pre-Sample Morts	CWT Releases	CWT Morts	Not CWT'd	Total Smolts Release	% CWT	Total Trap Fry Released
11-May-08	95		95		0	95	100%	10
12-May-08	2,350				2,350	2,350	0%	
13-May-08	851				851	851	0%	
14-May-08	1,212				1,212	1,212	0%	
15-May-08	2,324				2,324	2,324	0%	
16-May-08	2,448		1,088		1,360	2,448	44%	25
17-May-08	1,773				1,773	1,773	0%	
18-May-08	2,054				2,054	2,054	0%	
19-May-08	1,828		1,141		687	1,828	62%	30
20-May-08	1,327		1,027		300	1,327	77%	
21-May-08	437				437	437	0%	
22-May-08	380				380	380	0%	
23-May-08	399				399	399	0%	11
24-May-08	245				245	245	0%	
25-May-08	320				320	320	0%	
26-May-08	247				247	247	0%	
27-May-08	695				695	695	0%	
28-May-08	402				402	402	0%	
29-May-08	245				245	245	0%	
30-May-08	662				662	662	0%	1,280
31-May-08	358		348		10	358	97%	120
1-Jun-08	100		98		2	100	98%	60
2-Jun-08	3				3	3	0%	
3-Jun-08	2				2	2	0%	
4-Jun-08	3				3	3	0%	5
Totals	**34,700**	**499**	**10,428**	**2**	**23,773**	**34,201**	**30%**	**1,838**

Appendix C. Daily catch of other species at the Black Creek out-migration fence, 2008.

Date	CUT Adult	CUT Juv	CUT Total	All incidental catch released	Note
1-Apr-08			0	0	Put trap in and start fishing
2-Apr-08		1	1	1	
3-Apr-08	2		2	2	
4-Apr-08			0	0	
5-Apr-08			0	0	
6-Apr-08	3		3	3	pull panels high water
7-Apr-08	2		2	2	panels out, not effectively fishing
8-Apr-08			0	0	panels out, not effectively fishing
9-Apr-08			0	0	panels out, not effectively fishing
10-Apr-08			0	0	panels out, not effectively fishing
11-Apr-08			0	0	panels out, not effectively fishing
12-Apr-08			0	2	panels out, not effectively fishing
13-Apr-08			0	2	Panels in and fishing again
14-Apr-08	6		6	6	Panels in and fishing again
15-Apr-08			0	0	Panels in and fishing again
16-Apr-08	8		8	8	Panels in and fishing again
17-Apr-08	7		7	7	Trap fishing effectively
18-Apr-08			0	0	
19-Apr-08	1		1	1	
20-Apr-08			0	0	
21-Apr-08			0	0	
22-Apr-08			0	0	
23-Apr-08			0	0	
24-Apr-08			0	0	
25-Apr-08	2		2	2	
26-Apr-08	2		2	2	
27-Apr-08	15		15	15	
28-Apr-08	3		3	6	2 sculpin
29-Apr-08	14	3	17	32	1 sculpin
30-Apr-08	9		9	17	6 sculpin and 2 lamprey
1-May-08	13	5	18	50	2 sculpin and 2 lamprey
2-May-08	4	1	5	30	1 sculpin and 1 lamprey
3-May-08			0	20	5 sculpins
4-May-08	7		7	28	6 sculpins
5-May-08			0	0	
6-May-08			0	0	
7-May-08	5		5	103	6 lamprey and 4 sculpins
8-May-08	20		20	53	2 lampreys and 4 sculpins
9-May-08	32		32	55	2 lampreys and 2 sculpins
10-May-08	5	6	11	26	1 sculpin
11-May-08	2		2	12	1 sculpin
12-May-08			0	0	

Date	CUT Adult	CUT Juv	CUT Total	All incidental catch released	Note
13-May-08			0	0	
14-May-08			0	0	
15-May-08			0	0	
16-May-08	7	7	14	39	3 sculpins
17-May-08			0	0	
18-May-08			0	0	
19-May-08	8	10	18	48	
20-May-08			0	0	
21-May-08			0	0	
22-May-08			0	0	
23-May-08	4		4	15	
24-May-08			0	0	
25-May-08			0	0	
26-May-08			0	0	
27-May-08			0	0	
28-May-08			0	0	
29-May-08			0	0	
30-May-08	7	10	17	1,297	1 lamprey and 2 sculpins
31-May-08	2	3	5	125	3 lamprey
1-Jun-08			0	60	1 sculpin
2-Jun-08			0	0	
3-Jun-08			0	0	
4-Jun-08	2	3	5	10	1 sculpin
Totals	**192**	**49**	**241**	**2,079**	

Appendix D. Individual coho smolt length (mm), weight (g), and scale age, 2008.

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
1	02-Apr-08	50666	1	171		33	20	
2	02-Apr-08	50666	2	131		33	20	
3	02-Apr-08	50666	3	122		22	10	
4	02-Apr-08	50666	4	120		22	10	
5	02-Apr-08	50666	5	105		22	10	
6	02-Apr-08	50666	6	151		33	20	
7	02-Apr-08	50666	7	115		22	10	
8	02-Apr-08	50666	8	135		0M	M0	RG
9	02-Apr-08	50666	9	140		0M	M0	RG
10	02-Apr-08	50666	10	172		33	20	
11	02-Apr-08	50666	11	145		33	20	
12	02-Apr-08	50666	12	183		33	20	
13	02-Apr-08	50666	13	120				NS
14	02-Apr-08	50666	14	130		22	10	
15	02-Apr-08	50666	15	115		22	10	
16	02-Apr-08	50666	16	95		0M	M0	RG
17	02-Apr-08	50666	17	160		33	20	
18	02-Apr-08	50666	18	175		33	20	
19	02-Apr-08	50666	19	130		22	10	
20	02-Apr-08	50666	20	175		33	20	
21	02-Apr-08	50666	21	165		33	20	
22	02-Apr-08	50666	22	185		33	20	
23	02-Apr-08	50666	23	165		33	20	
24	02-Apr-08	50666	24	175		33	20	
25	02-Apr-08	50666	25	185		33	20	
26	02-Apr-08	50666	26	185		0M	M0	RG
27	02-Apr-08	50666	27	190		33	20	
28	02-Apr-08	50666	28	175		0M	M0	RG
29	02-Apr-08	50666	29	125		22	10	
30	02-Apr-08	50666	30	165		33	20	
31	02-Apr-08	50666	31	150				NS
32	02-Apr-08	50666	32	120		22	10	
33	02-Apr-08	50666	33	190		33	20	
34	02-Apr-08	50666	34	180				NS
35	02-Apr-08	50666	35	175		33	20	
36	02-Apr-08	50666	36	186		33	20	
37	02-Apr-08	50666	37	170		33	20	
38	02-Apr-08	50666	38	165		33	20	
39	02-Apr-08	50666	39	170				MF

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
40	02-Apr-08	50666	40	170		33	20	
41	02-Apr-08	50666	41	185				NS
42	02-Apr-08	50666	42	175		33	20	
43	02-Apr-08	50666	43	180		33	20	
44	02-Apr-08	50666	44	195		33	20	
45	02-Apr-08	50666	45	175		33	20	
46	02-Apr-08	50666	46	110		33	20	
47	02-Apr-08	50666	47	165		33	20	
48	02-Apr-08	50666	48	170		33	20	
49	02-Apr-08	50666	49	160		33	20	
50	02-Apr-08	50666	50	165		33	20	
51	02-Apr-08	50667	1	175		33	20	
52	02-Apr-08	50667	2	180		0M	M0	RG
53	02-Apr-08	50667	3	160		33	20	
54	02-Apr-08	50667	4	170		33	20	
55	02-Apr-08	50667	5	180		33	20	
56	02-Apr-08	50667	6	185		33	20	
57	02-Apr-08	50667	7	145		22	10	
58	02-Apr-08	50667	8	150		33	20	
59	02-Apr-08	50667	9	170		33	20	
60	02-Apr-08	50667	10	175		0M	M0	UF
61	02-Apr-08	50667	11	180		33	20	
62	02-Apr-08	50667	12	190		33	20	
63	02-Apr-08	50667	13	180		33	20	
64	02-Apr-08	50667	14	190		33	20	
65	02-Apr-08	50667	15	160		0M	M0	RG
66	02-Apr-08	50667	16	170		33	20	
67	02-Apr-08	50667	17	160		33	20	
68	02-Apr-08	50667	18	145		0M	M0	RG
69	02-Apr-08	50667	19	180		0M	M0	RG
70	02-Apr-08	50667	20	175		33	20	
71	02-Apr-08	50667	21	160		33	20	
72	02-Apr-08	50667	22	165		33	20	
73	02-Apr-08	50667	23	175		33	20	
74	02-Apr-08	50667	24	130		22	10	
75	02-Apr-08	50667	25	175		33	20	
76	02-Apr-08	50667	26	170		33	20	
77	02-Apr-08	50667	27	130		22	10	
78	02-Apr-08	50667	28	170		33	20	
79	02-Apr-08	50667	29	175		33	20	
80	02-Apr-08	50667	30	170		33	20	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
81	02-Apr-08	50667	31	170		33	20	
82	02-Apr-08	50667	32	145		22	10	
83	02-Apr-08	50667	33	135		0M	M0	RG
84	02-Apr-08	50667	34	145		22	10	
85	02-Apr-08	50667	35	135		22	10	
86	02-Apr-08	50667	36	175		33	20	
87	02-Apr-08	50667	37	165		33	20	
88	02-Apr-08	50667	38	170		33	20	
89	02-Apr-08	50667	39	165		33	20	
90	02-Apr-08	50667	40	170		0M	M0	RG
91	02-Apr-08	50667	41	160		33	20	
92	02-Apr-08	50667	42	170		0M	M0	RG
93	02-Apr-08	50667	43	120		22	10	
94	02-Apr-08	50667	44	185		33	20	
95	02-Apr-08	50667	45	170		33	20	
96	02-Apr-08	50667	46	165		33	20	
97	02-Apr-08	50667	47	135		22	10	
98	02-Apr-08	50667	48	140		22	10	
99	02-Apr-08	50667	49	110		33	20	
100	02-Apr-08	50667	50	130		22	10	
101	01-May-08	50668	1	125		22	10	
102	01-May-08	50668	2	120		22	10	
103	01-May-08	50668	3	130		0M	M0	RG
104	01-May-08	50668	4	180		33	20	
105	01-May-08	50668	5	190		33	20	
106	01-May-08	50668	6	130		22	10	
107	01-May-08	50668	7	140		22	10	
108	01-May-08	50668	8	115				UD
109	01-May-08	50668	9	160		0M	M0	RG
110	01-May-08	50668	10	160		33	20	
111	01-May-08	50668	11	145		0M	M0	RG
112	01-May-08	50668	12	130		22	10	
113	01-May-08	50668	13	130		22	10	
114	01-May-08	50668	14	125		22	10	
115	01-May-08	50668	15	175		33	20	
116	01-May-08	50668	16	180		22	10	
117	02-May-08	50668	17	120				UD
118	02-May-08	50668	18	185		33	20	
119	02-May-08	50668	19	135		22	10	
120	02-May-08	50668	20	135		22	10	
121	02-May-08	50668	21	135		22	10	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
122	02-May-08	50668	22	130		22	10	
123	02-May-08	50668	23	190		33	20	
124	02-May-08	50668	24	115		22	10	
125	02-May-08	50668	25	125		22	10	
126	02-May-08	50668	26	130		22	10	
127	02-May-08	50668	27	160		33	20	
128	02-May-08	50668	28	160		33	20	
129	02-May-08	50668	29	155		33	20	
130	02-May-08	50668	30	155		33	20	
131	02-May-08	50668	31	125		22	10	
132	02-May-08	50668	32	190		33	20	
133	02-May-08	50668	33	140		22	10	
134	02-May-08	50668	34	170		33	20	
135	02-May-08	50668	35	115		0M	M0	RG
136	02-May-08	50668	36	130		22	10	
137	02-May-08	50668	37	200		33	20	
138	02-May-08	50668	38	138		22	10	
139	02-May-08	50668	39	172		33	20	
140	02-May-08	50668	40	173		33	20	
141	02-May-08	50668	41	167				UD
142	02-May-08	50668	42	135		0M	M0	RG
143	02-May-08	50668	43	255		33	20	
144	02-May-08	50668	44	132		22	10	
145	02-May-08	50668	45	135		22	10	
146	02-May-08	50668	46	133		0M	M0	UF
147	02-May-08	50668	47	135		0M	M0	RG
148	02-May-08	50668	48	123		22	10	
149	02-May-08	50668	49	145		33	20	
150	02-May-08	50668	50	136		22	10	
151	03-May-08	50669	1	135	23.60	0M	M0	RG
152	03-May-08	50669	2	125	20.00	22	10	
153	03-May-08	50669	3	120	18.90	0M	M0	RG
154	03-May-08	50669	4	145	28.30	33	20	
155	03-May-08	50669	5	145	29.20	22	10	
156	03-May-08	50669	6	148	29.40	22	10	
157	03-May-08	50669	7	120	16.60	22	10	
158	03-May-08	50669	8	130	27.90	22	10	
159	03-May-08	50669	9	145	29.10	22	10	
160	03-May-08	50669	10	110	13.40	22	10	
161	03-May-08	50669	11	120	18.90	22	10	
162	03-May-08	50669	12	145	32.70	33	20	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
163	03-May-08	50669	13	152	40.40	22	10	
164	03-May-08	50669	14	150	32.90	22	10	
165	03-May-08	50669	15	140	30.00	0M	M0	RG
166	03-May-08	50669	16	130	23.00	33	20	
167	03-May-08	50669	17	130	16.20	22	10	
168	03-May-08	50669	18	135	24.30	22	10	
169	03-May-08	50669	19	130	24.90	0M	M0	RG
170	03-May-08	50669	20	135	23.10	22	10	
171	03-May-08	50669	21	110	14.10	22	10	
172	03-May-08	50669	22	165	43.10	0M	M0	RG
173	03-May-08	50669	23	150	33.60	22	10	
174	03-May-08	50669	24	145	35.10	22	10	
175	04-May-08	50669	25	125	18.60	0M	M0	RG
176	04-May-08	50669	26	147	30.70	33	20	
177	04-May-08	50669	27	140	25.50	33	20	
178	04-May-08	50669	28	140	28.80	33	20	
179	04-May-08	50669	29	130	25.80	33	20	
180	04-May-08	50669	30	135	27.80	0M	M0	RG
181	06-May-08	50669	31	135	23.80	22	10	
182	06-May-08	50669	32	127	19.40	33	20	
183	06-May-08	50669	33	138	25.10	22	10	
184	06-May-08	50669	34	132	22.00	22	10	
185	06-May-08	50669	35	128	22.20	22	10	
186	06-May-08	50669	36	135	27.40	22	10	
187	06-May-08	50669	37	148	30.50	22	10	
188	06-May-08	50669	38	150	34.90	22	10	
189	06-May-08	50669	39	132	23.00	22	10	
190	06-May-08	50669	40	138	28.70	0M	M0	RG
191	06-May-08	50669	41	130	25.40	22	10	
192	06-May-08	50669	42	125	19.80	22	10	
193	06-May-08	50669	43	120	17.80	33	20	
194	06-May-08	50669	44	125	20.60	22	10	
195	06-May-08	50669	45	128	22.20	0M	M0	RG
196	06-May-08	50669	46	120	18.10	0M	M0	RG
197	06-May-08	50669	47	128	20.80	33	20	
198	06-May-08	50669	48	130	23.20	22	10	
199	06-May-08	50669	49	140	25.80	0M	M0	RG
200	06-May-08	50669	50	125	20.60	22	10	
201	07-May-08	50670	1	95	9.30	22	10	
202	07-May-08	50670	2	110	9.40	0M	M0	RG
203	07-May-08	50670	3	118	14.30	22	10	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
204	07-May-08	50670	4	118	16.40	22	10	
205	07-May-08	50670	5	120	17.00	22	10	
206	07-May-08	50670	6	110	14.10	33	20	
207	07-May-08	50670	7	128	21.30	0M	M0	RG
208	07-May-08	50670	8	120	16.00	22	10	
209	07-May-08	50670	9	120	16.50	33	20	
210	07-May-08	50670	10	125	21.20	22	10	
211	07-May-08	50670	11	120	17.00	22	10	
212	07-May-08	50670	12	130	26.60	22	10	
213	07-May-08	50670	13	120	17.80	22	10	
214	07-May-08	50670	14	125	19.90	22	10	
215	07-May-08	50670	15	100	10.10	22	10	
216	07-May-08	50670	16	120	19.30	22	10	
217	07-May-08	50670	17	100	9.30	22	10	
218	07-May-08	50670	18	130	22.30	33	20	
219	07-May-08	50670	19	120	20.00	22	10	
220	07-May-08	50670	20	115	14.90	0M	M0	RG
221	07-May-08	50670	21	130	19.90	22	10	
222	07-May-08	50670	22	115	13.00	22	10	
223	07-May-08	50670	23	115	14.40	22	10	
224	07-May-08	50670	24	125	20.40	22	10	
225	07-May-08	50670	25	115	16.70	22	10	
226	07-May-08	50670	26	130	22.60	22	10	
227	07-May-08	50670	27	115	10.90	22	10	
228	07-May-08	50670	28	110	12.90	33	20	
229	07-May-08	50670	29	130	19.90	22	10	
230	07-May-08	50670	30	130	23.00	22	10	
231	07-May-08	50670	31	135	24.50	22	10	
232	07-May-08	50670	32	120	18.60	22	10	
233	07-May-08	50670	33	130	18.20	22	10	
234	07-May-08	50670	34	120	17.30	22	10	
235	07-May-08	50670	35	125	22.40	22	10	
236	07-May-08	50670	36	120	16.10	22	10	
237	07-May-08	50670	37	115	14.70	33	20	
238	07-May-08	50670	38	130	22.80	33	20	
239	07-May-08	50670	39	108	11.60	22	10	
240	07-May-08	50670	40	140	26.90	33	20	
241	07-May-08	50670	41	145	32.90	22	10	
242	07-May-08	50670	42	140	30.20	22	10	
243	07-May-08	50670	43	128	19.40	22	10	
244	07-May-08	50670	44	120	14.20	22	10	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
245	07-May-08	50670	45	130	24.90	22	10	
246	07-May-08	50670	46	135	22.10	22	10	
247	07-May-08	50670	47	125	19.80	22	10	
248	07-May-08	50670	48	120	16.80	22	10	
249	07-May-08	50670	49	130	20.60	33	20	
250	07-May-08	50670	50	145	27.70	22	10	
251	10-May-08	50671	1	110	12.90	22	10	
252	10-May-08	50671	2	110	14.10	22	10	
253	10-May-08	50671	3	135	24.00	22	10	
254	10-May-08	50671	4	105	11.00	22	10	
255	10-May-08	50671	5	110	12.80	22	10	
256	10-May-08	50671	6	110	16.00	0M	M0	RG
257	10-May-08	50671	7	110	12.00	22	10	
258	10-May-08	50671	8	100	8.60	0M	M0	RG
259	10-May-08	50671	9	100	9.30	22	10	
260	10-May-08	50671	10	100	11.00	0M	M0	RG
261	10-May-08	50671	11	108	12.10	22	10	
262	10-May-08	50671	12	95	7.40	22	10	
263	10-May-08	50671	13	105	10.10	0M	M0	RG
264	10-May-08	50671	14	110	10.10	33	20	
265	10-May-08	50671	15	110	13.10	22	10	
266	10-May-08	50671	16	95	9.90	22	10	
267	10-May-08	50671	17	102	10.50	22	10	
268	10-May-08	50671	18	100		22	10	
269	10-May-08	50671	19	110	10.70	22	10	
270	10-May-08	50671	20			22	10	
271	10-May-08	50671	21	145	26.30	22	10	
272	10-May-08	50671	22	105	11.60	22	10	
273	10-May-08	50671	23	100	9.70	22	10	
274	10-May-08	50671	24	110	10.30	22	10	
275	10-May-08	50671	25	95	9.40	0M	M0	RG
276	10-May-08	50671	26	100	10.80	22	10	
277	10-May-08	50671	27	110	13.70	22	10	
278	10-May-08	50671	28	110	14.50	22	10	
279	10-May-08	50671	29	170	48.00	33	20	
280	10-May-08	50671	30	105	11.20	22	10	
281	10-May-08	50671	31	110	11.10	0M	M0	RG
282	10-May-08	50671	32	168	38.00	0M	M0	RG
283	10-May-08	50671	33	110	13.70	22	10	
284	10-May-08	50671	34	105	11.10	22	10	
285	10-May-08	50671	35	145	29.00	22	10	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
286	10-May-08	50671	36	105	11.70	22	10	
287	10-May-08	50671	37	112	15.00	22	10	
288	10-May-08	50671	38	110	13.00	22	10	
289	10-May-08	50671	39	145	28.00	0M	M0	UF
290	10-May-08	50671	40	110	12.70	22	10	
291	10-May-08	50671	41	150	32.00	22	10	
292	10-May-08	50671	42	115	12.50	22	10	
293	10-May-08	50671	43	152	32.00	22	10	
294	10-May-08	50671	44	138	26.00	0M	M0	RG
295	10-May-08	50671	45	100	11.00	22	10	
296	10-May-08	50671	46	114	14.50	22	10	
297	10-May-08	50671	47	135	21.40	0M	M0	RG
298	10-May-08	50671	48	105	12.00	33	20	
299	10-May-08	50671	49	130	21.00	0M	M0	RG
300	10-May-08	50671	50	148	40.00	22	10	
301	12-May-08	65081	1	110	12.50	22	10	
302	12-May-08	65081	2	105	10.50	22	10	
303	12-May-08	65081	3	130	21.00	22	10	
304	12-May-08	65081	4	125	19.70	0M	M0	RG
305	12-May-08	65081	5	108	12.30	22	10	
306	12-May-08	65081	6	115	15.40	22	10	
307	12-May-08	65081	7	128	20.00	22	10	
308	12-May-08	65081	8	115	15.00	22	10	
309	12-May-08	65081	9	122	17.50	22	10	
310	12-May-08	65081	10	112	15.30	22	10	
311	12-May-08	65081	11	104	11.80	22	10	
312	12-May-08	65081	12	122	19.10	33	20	
313	12-May-08	65081	13	128	22.20	22	10	
314	12-May-08	65081	14	140	25.00	22	10	
315	12-May-08	65081	15	140	27.60	22	10	
316	12-May-08	65081	16	116	15.30	22	10	
317	12-May-08	65081	17	110	12.20	0M	M0	RG
318	12-May-08	65081	18	122	17.20	22	10	
319	12-May-08	65081	19	125	19.00	0M	M0	RG
320	12-May-08	65081	20	115	14.10	22	10	
321	12-May-08	65081	21	120	19.80	22	10	
322	12-May-08	65081	22	118	15.20	0M	M0	RG
323	12-May-08	65081	23	113	12.80	22	10	
324	12-May-08	65081	24	130	19.20	22	10	
325	12-May-08	65081	25	109	10.90	22	10	
326	12-May-08	65081	26	118	18.30	22	10	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
327	12-May-08	65081	27	110	13.10	22	10	
328	12-May-08	65081	28	105	10.90	22	10	
329	12-May-08	65081	29	142	26.10	22	10	
330	12-May-08	65081	30	118	14.80	0M	M0	RG
331	12-May-08	65081	31	115	14.50	22	10	
332	12-May-08	65081	32	128	21.40	22	10	
333	12-May-08	65081	33	115	14.00	22	10	
334	12-May-08	65081	34	105	12.10	22	10	
335	12-May-08	65081	35	110	14.00	22	10	
336	12-May-08	65081	36	118	14.20	0M	M0	RG
337	12-May-08	65081	37	120	17.30	22	10	
338	12-May-08	65081	38	120	17.60	22	10	
339	12-May-08	65081	39	118	17.00	0M	M0	RG
340	12-May-08	65081	40	120	17.20	22	10	
341	12-May-08	65081	41	215	87.50	0M	M0	W
342	13-May-08	65081	42	125	18.40	33	20	
343	13-May-08	65081	43	105	11.50	22	10	
344	13-May-08	65081	44	120	15.70	0M	M0	RG
345	13-May-08	65081	45	110	13.40	22	10	
346	13-May-08	65081	46	104	10.80	22	10	
347	13-May-08	65081	47	130	22.70	0M	M0	RG
348	13-May-08	65081	48	125	20.60	0M	M0	RG
349	13-May-08	65081	49	108	12.40	22	10	
350	13-May-08	65081	50	110	14.60	22	10	
351	13-May-08	65082	1	110	15.10	22	10	
352	13-May-08	65082	2	115	14.70	22	10	
353	13-May-08	65082	3	114	15.00	0M	M0	RG
354	13-May-08	65082	4	120	18.00	0M	M0	RG
355	13-May-08	65082	5	125	17.70	22	10	
356	13-May-08	65082	6	110	13.90	22	10	
357	13-May-08	65082	7	110	12.00	0M	M0	RG
358	13-May-08	65082	8	122	17.10	22	10	
359	13-May-08	65082	9	142	24.80	0M	M0	RG
360	13-May-08	65082	10	110	13.70	22	10	
361	13-May-08	65082	11	111	13.50	22	10	
362	13-May-08	65082	12	130	23.20	22	10	
363	13-May-08	65082	13	110	12.90	22	10	
364	13-May-08	65082	14	110	11.60	22	10	
365	13-May-08	65082	15	120	17.20	22	10	
366	13-May-08	65082	16	120	19.20	22	10	
367	13-May-08	65082	17	123	17.00	0M	M0	UF

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
368	13-May-08	65082	18	120	17.10	0M	M0	RG
369	13-May-08	65082	19	118	16.40	0M	M0	RG
370	13-May-08	65082	20	115	14.80	0M	M0	UF
371	13-May-08	65082	21	122	17.00	0M	M0	RG
372	13-May-08	65082	22	110	13.10	22	10	
373	13-May-08	65082	23	105	11.30	0M	M0	RG
374	13-May-08	65082	24	122	21.80	22	10	
375	13-May-08	65082	25	115	16.10	0M	M0	RG
376	13-May-08	65082	26	100	10.50	22	10	
377	13-May-08	65082	27	115	16.00	22	10	
378	13-May-08	65082	28	115	14.10	0M	M0	RG
379	13-May-08	65082	29	120	17.50	22	10	
380	13-May-08	65082	30	138	25.90	22	10	
381	14-May-08	65082	31	118	15.50	22	10	
382	14-May-08	65082	32	132	23.30	22	10	
383	14-May-08	65082	33	125	17.20	22	10	
384	14-May-08	65082	34	122	19.00	22	10	
385	14-May-08	65082	35	125	19.90	22	10	
386	14-May-08	65082	36	125	21.50	0M	M0	RG
387	14-May-08	65082	37	125	18.50	22	10	
388	14-May-08	65082	38	122	18.40	0M	M0	RG
389	14-May-08	65082	39	116	16.30	22	10	
390	14-May-08	65082	40	118	15.20	33	20	
391	14-May-08	65082	41	105	13.40	0M	M0	RG
392	14-May-08	65082	42	130	21.10	22	10	
393	14-May-08	65082	43	124	19.80	0M	M0	RG
394	14-May-08	65082	44	104	11.80	22	10	
395	14-May-08	65082	45	110	13.00	22	10	
396	14-May-08	65082	46	110	13.30	0M	M0	RG
397	14-May-08	65082	47	100	10.40	22	10	
398	14-May-08	65082	48	115	15.20	22	10	
399	14-May-08	65082	49	120	18.30	0M	M0	RG
400	14-May-08	65082	50	135	23.50	0M	M0	RG
401	14-May-08	65083	1	136	23.80	0M	M0	RG
402	14-May-08	65083	2	105	11.80	0M	M0	RG
403	14-May-08	65083	3	115	14.40	0M	M0	RG
404	14-May-08	65083	4	125	17.80	22	10	
405	14-May-08	65083	5	105	11.20	22	10	
406	14-May-08	65083	6	120	15.30	0M	M0	RG
407	14-May-08	65083	7	115	13.90	22	10	
408	14-May-08	65083	8	106	12.60	0M	M0	RG

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
409	14-May-08	65083	9	104	10.20	0M	M0	RG
410	14-May-08	65083	10	118	14.20	22	10	
411	14-May-08	65083	11	124	18.40	0M	M0	LL
412	14-May-08	65083	12	115	16.50	0M	M0	RG
413	14-May-08	65083	13	114	14.90	0M	M0	RG
414	14-May-08	65083	14	102	10.70	22	10	
415	14-May-08	65083	15	100	10.20	0M	M0	RG
416	14-May-08	65083	16	130	22.40	0M	M0	RG
417	14-May-08	65083	17	128	19.10	0M	M0	RG
418	14-May-08	65083	18	132	20.50	22	10	
419	14-May-08	65083	19	122	16.40	0M	M0	RG
420	14-May-08	65083	20	130	20.10	22	10	
421	14-May-08	65083	21	118	15.30	33	20	
422	14-May-08	65083	22	110	11.00	0M	M0	RG
423	14-May-08	65083	23	110	13.10	22	10	
424	14-May-08	65083	24	120	17.10	0M	M0	RG
425	14-May-08	65083	25	128	20.50	22	10	
426	14-May-08	65083	26	120	18.10	0M	M0	RG
427	14-May-08	65083	27	130	19.60	22	10	
428	14-May-08	65083	28	105	11.20	22	10	
429	14-May-08	65083	29	102	11.00	0M	M0	RG
430	14-May-08	65083	30	110	17.60	22	10	
431	14-May-08	65083	31	112	13.40	22	10	
432	15-May-08	65083	32	130	22.40	0M	M0	RG
433	15-May-08	65083	33	120	17.90	22	10	
434	15-May-08	65083	34	128	22.30	22	10	
435	15-May-08	65083	35	128	19.40	0M	M0	RG
436	15-May-08	65083	36	116	16.40	22	10	
437	15-May-08	65083	37	110	12.10	0M	M0	RG
438	15-May-08	65083	38	128	20.30	0M	M0	RG
439	15-May-08	65083	39	123	19.10	22	10	
440	15-May-08	65083	40	115	16.40	0M	M0	RG
441	15-May-08	65083	41	118	16.60	22	10	
442	15-May-08	65083	42	128	18.10	22	10	
443	15-May-08	65083	43	132	24.90	0M	M0	RG
444	15-May-08	65083	44	130	20.00	22	10	
445	15-May-08	65083	45	128	20.00	0M	M0	RG
446	15-May-08	65083	46	131	21.20	0M	M0	RG
447	15-May-08	65083	47	120	16.20	0M	M0	RG
448	15-May-08	65083	48	110	12.20	0M	M0	RG
449	15-May-08	65083	49	114	14.00	22	10	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
450	15-May-08	65083	50	150	32.10	33	20	
451	15-May-08	65084	1	120	17.00	22	10	
452	15-May-08	65084	2	115	13.50	22	10	
453	15-May-08	65084	3	114	14.10	0M	M0	RG
454	15-May-08	65084	4	120	16.90	0M	M0	RG
455	15-May-08	65084	5	122	19.10	22	10	
456	15-May-08	65084	6	125	19.20	0M	M0	RG
457	15-May-08	65084	7	118	14.90	22	10	
458	15-May-08	65084	8	130	22.10	22	10	
459	15-May-08	65084	9	135	23.60	0M	M0	RG
460	15-May-08	65084	10	110	11.90	22	10	
461	15-May-08	65084	11	115	13.00	0M	M0	RG
462	15-May-08	65084	12	122	18.90	0M	M0	RG
463	15-May-08	65084	13	135	25.60	22	10	
464	15-May-08	65084	14	122	18.70	33	20	
465	15-May-08	65084	15	143	29.20	0M	M0	RG
466	15-May-08	65084	16	115	14.70	22	10	
467	15-May-08	65084	17	110	13.10	22	10	
468	15-May-08	65084	18	110	14.60	22	10	
469	15-May-08	65084	19	118	14.60	0M	M0	RG
470	15-May-08	65084	20	125	19.30	0M	M0	RG
471	18-May-08	65084	21	102	10.20	0M	M0	RG
472	18-May-08	65084	22	95	8.00	0M	M0	UF
473	18-May-08	65084	23	110	13.20	22	10	
474	18-May-08	65084	24	115	13.70	22	10	
475	18-May-08	65084	25	110	13.10	0M	M0	RG
476	18-May-08	65084	26	105	11.70	22	10	
477	18-May-08	65084	27	110	13.90	0M	M0	RG
478	18-May-08	65084	28	110	14.00	22	10	
479	18-May-08	65084	29	115	15.90	0M	M0	RG
480	18-May-08	65084	30	120	17.20	0M	M0	RG
481	18-May-08	65084	31	100	9.90	22	10	
482	18-May-08	65084	32	98	8.80	22	10	
483	18-May-08	65084	33	100	10.10	0M	M0	RG
484	18-May-08	65084	34	95	8.90	22	10	
485	18-May-08	65084	35	105	12.40	22	10	
486	18-May-08	65084	36	105	12.90	0M	M0	RG
487	18-May-08	65084	37	112	14.10	22	10	
488	18-May-08	65084	38	100	10.90	22	10	
489	18-May-08	65084	39	115	14.60	22	10	
490	18-May-08	65084	40	110	12.40	22	10	

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
491	18-May-08	65084	41	128	20.00	22	10	
492	18-May-08	65084	42	110	12.90	22	10	
493	18-May-08	65084	43	125	20.10	0M	M0	RG
494	18-May-08	65084	44	105	13.10	22	10	
495	18-May-08	65084	45	100	11.20	22	10	
496	18-May-08	65084	46	90	8.10	22	10	
497	18-May-08	65084	47	110	11.60			UD
498	18-May-08	65084	48	105	11.90	0M	M0	RG
499	18-May-08	65084	49	115	14.20	22	10	
500	18-May-08	65084	50	105	12.00			UD
501	18-May-08	65085	1	125	19.00	22	10	
502	18-May-08	65085	2	105	11.40	22	10	
503	18-May-08	65085	3	121	18.00	22	10	
504	18-May-08	65085	4	120	17.60	22	10	
505	18-May-08	65085	5	100	9.60	22	10	
506	18-May-08	65085	6	115	14.60	22	10	
507	18-May-08	65085	7	105	11.80	0M	M0	RG
508	18-May-08	65085	8	115	14.60	0M	M0	RG
509	18-May-08	65085	9	116	17.10	0M	M0	RG
510	18-May-08	65085	10	107	12.30	22	10	
511	18-May-08	65085	11	115	18.50	22	10	
512	18-May-08	65085	12	110	13.10	22	10	
513	18-May-08	65085	13	110	13.40	0M	M0	RG
514	18-May-08	65085	14	125	18.00	0M	M0	RG
515	18-May-08	65085	15	120	16.90	22	10	
516	18-May-08	65085	16	130	19.00	0M	M0	RG
517	18-May-08	65085	17	115	16.00	22	10	
518	18-May-08	65085	18	118	16.80	0M	M0	RG
519	18-May-08	65085	19	120	15.10			UD
520	18-May-08	65085	20	119	15.60	22	10	
521	18-May-08	65085	21	115	15.00	22	10	
522	18-May-08	65085	22	99	11.20			UD
523	18-May-08	65085	23	117	11.10	22	10	
524	18-May-08	65085	24	145	29.00	0M	M0	RG
525	18-May-08	65085	25	120	15.70	0M	M0	RG
526	19-May-08	65085	26	92	8.20	0M	M0	RG
527	19-May-08	65085	27	120	18.60	0M	M0	RG
528	19-May-08	65085	28	102	11.70	22	10	
529	19-May-08	65085	29	115	14.30	22	10	
530	19-May-08	65085	30	90	6.90	22	10	
531	19-May-08	65085	31	115	13.60	0M	M0	RG

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
532	19-May-08	65085	32	120	15.80	22	10	
533	19-May-08	65085	33	132	23.00	0M	M0	RG
534	19-May-08	65085	34	94	8.60	22	10	
535	19-May-08	65085	35	125	20.30	22	10	
536	19-May-08	65085	36	115	13.10	22	10	
537	19-May-08	65085	37	125	19.20	0M	M0	RG
538	19-May-08	65085	38	120	20.10	22	10	
539	19-May-08	65085	39	93	8.00	22	10	
540	19-May-08	65085	40	110	13.30	33	20	
541	19-May-08	65085	41	115	14.50	22	10	
542	19-May-08	65085	42	125	19.50	0M	M0	RG
543	19-May-08	65085	43	130	22.80	0M	M0	RG
544	19-May-08	65085	44	130	20.80	22	10	
545	19-May-08	65085	45	120	16.90	22	10	
546	19-May-08	65085	46	118	15.90	22	10	
547	19-May-08	65085	47	110	12.90	22	10	
548	19-May-08	65085	48	105	10.90	22	10	
549	19-May-08	65085	49	120	15.30	22	10	
550	19-May-08	65085	50	105	11.20	0M	M0	RG
551	20-May-08	65086	1	115	16.40	0M	M0	RG
552	20-May-08	65086	2	105	12.90	22	10	
553	20-May-08	65086	3	110	13.60	22	10	
554	20-May-08	65086	4	115	14.10	0M	M0	RG
555	20-May-08	65086	5	115	14.50	22	10	
556	20-May-08	65086	6	100	10.60	0M	M0	RG
557	20-May-08	65086	7	100	11.20	0M	M0	RG
558	20-May-08	65086	8	110	13.50	0M	M0	RG
559	20-May-08	65086	9	130	18.10	33	20	
560	20-May-08	65086	10	118	16.90	22	10	
561	20-May-08	65086	11	110	16.40	22	10	
562	20-May-08	65086	12	115	15.20	0M	M0	RG
563	20-May-08	65086	13	120	15.80	22	10	
564	20-May-08	65086	14	100	11.10	22	10	
565	20-May-08	65086	15	102	12.50	22	10	
566	20-May-08	65086	16	123	20.80	0M	M0	RG
567	20-May-08	65086	17	130	22.30	22	10	
568	20-May-08	65086	18	120	19.40	0M	M0	RG
569	20-May-08	65086	19	116	17.10			UD
570	20-May-08	65086	20	115	15.40	0M	M0	RG
571	20-May-08	65086	21	105	11.10	0M	M0	RG
572	20-May-08	65086	22	110	13.70	0M	M0	RG

Fish	Date	Scale Book	Scale Number	Length (mm)	Weight (g)	Gilbert-Rich Age	European Age	Scale Quality
573	20-May-08	65086	23	95	8.50	22	10	
574	20-May-08	65086	24	130	23.50	22	10	
575	20-May-08	65086	25	125	21.10	0M	M0	RG
576	26-May-08	65086	26	98	8.80	0M	M0	RG
577	26-May-08	65086	27	106	11.90	0M	M0	RG
578	26-May-08	65086	28	110	12.20	22	10	
579	26-May-08	65086	29	132	22.20	22	10	
580	26-May-08	65086	30	92	7.60	22	10	
581	26-May-08	65086	31	85	8.90	0M	M0	RG
582	26-May-08	65086	32	110	13.10	22	10	
583	26-May-08	65086	33	120	15.10	0M	M0	RG
584	26-May-08	65086	34	120	15.90			UD
585	26-May-08	65086	35	108	12.00			UD
586	26-May-08	65086	36	95	8.90	22	10	
587	26-May-08	65086	37	110	12.60	0M	M0	RG
588	26-May-08	65086	38	95	9.40	22	10	
589	26-May-08	65086	39	115	15.30	22	10	
590	26-May-08	65086	40	100	9.50	22	10	
591	26-May-08	65086	41	120	15.90	0M	M0	RG
592	26-May-08	65086	42	110	10.80	22	10	
593	26-May-08	65086	43	110	12.10	22	10	
594	26-May-08	65086	44	108	12.00	0M	M0	RG
595	26-May-08	65086	45	122	14.80	22	10	
596	26-May-08	65086	46	115	13.90	22	10	
597	26-May-08	65086	47	95	9.20			NS
598	26-May-08	65086	48	100	8.70	22	10	
599	26-May-08	65086	49	100	9.80	22	10	
600	26-May-08	65086	50	115	13.60	22	10	

Appendix E. Individual coho smolt length (mm), weight (g), and condition factor (KC), 2008.

PERIOD 1				
Date	Fish	Length	Weight	KC
2-Apr	1	131	24.4	1.09
2-Apr	2	171	52.5	1.05
3-Apr	3	174	26.8	0.51
3-Apr	4	167	23.4	0.50
3-Apr	5	162	23.2	0.55
3-Apr	6	126	11.3	0.56
5-Apr	7	80	5.5	1.07
5-Apr	8	70	4.9	1.43
5-Apr	9	122	13.5	0.74
5-Apr	10	120	12.5	0.72
5-Apr	11	105	14.0	1.21
5-Apr	12	151	35.8	1.04
5-Apr	13	115	16.9	1.11
5-Apr	14	135	27.4	1.11
5-Apr	15	140	28.2	1.03
5-Apr	16	172	46.6	0.92
6-Apr	17	145	33.3	1.09
6-Apr	18	183	55.1	0.90
6-Apr	19	120	18.9	1.09
6-Apr	20	115	15.8	1.04
6-Apr	21	95	9.4	1.10
9-Apr	22	160	40.1	0.98
9-Apr	23	175	53.4	1.00
9-Apr	24	130	22.4	1.02
9-Apr	25	175	50.5	0.94
10-Apr	26	138	15.3	0.58
11-Apr	27	168	23.0	0.49
11-Apr	28	125	11.3	0.58
11-Apr	29	170	24.4	0.50
11-Apr	30	182	28.6	0.47
11-Apr	31	165	22.5	0.50
13-Apr	32	165	39.5	0.88
13-Apr	33	185	62.4	0.99
13-Apr	34	165	43.3	0.96
13-Apr	35	175	49.7	0.93
13-Apr	36	185	68.2	1.08
13-Apr	37	185	72.9	1.15
13-Apr	38	185	67.8	1.07
14-Apr	39	190	58.2	0.85
14-Apr	40	178	20.8	0.37
14-Apr	41	128	20.8	0.99
14-Apr	42	165	42.9	0.96
14-Apr	43	180	41.9	0.72
14-Apr	44	120	18.9	1.09

PERIOD 2				
Date	Fish	Length	Weight	KC
20-Apr	101	170	46.7	0.95
20-Apr	102	185	59.4	0.94
20-Apr	103	170	50.3	1.02
20-Apr	104	170	46.8	0.95
20-Apr	105	145	33.7	1.11
20-Apr	106	135	27.5	1.12
20-Apr	107	145	33.0	1.08
21-Apr	108	175	47.6	0.89
21-Apr	109	165	44.1	0.98
21-Apr	110	170	46.9	0.95
21-Apr	111	165	46.5	1.04
21-Apr	112	170	45.5	0.93
21-Apr	113	160	38.5	0.94
21-Apr	114	170	47.5	0.97
21-Apr	115	120	19.5	1.13
21-Apr	116	185	66.3	1.05
21-Apr	117	170	46.0	0.94
21-Apr	118	165	42.0	0.93
21-Apr	119	135	26.0	1.06
23-Apr	120	140	37.4	1.36
23-Apr	121	110	18.5	1.39
23-Apr	122	130	24.3	1.11
23-Apr	123	125	22.1	1.13
23-Apr	124	120	18.9	1.09
23-Apr	125	130	21.9	1.00
23-Apr	126	180	66.6	1.14
23-Apr	127	180	70.8	1.21
23-Apr	128	130	24.3	1.11
26-Apr	129	140	29.1	1.06
26-Apr	130	115	17.3	1.14
26-Apr	131	160	36.5	0.89
26-Apr	132	160	39.7	0.97
26-Apr	133	145	30.5	1.00
26-Apr	134	130	22.1	1.01
26-Apr	135	130	23.0	1.05
26-Apr	136	125	19.6	1.00
26-Apr	137	175	50.7	0.95
26-Apr	138	180	32.9	0.56
28-Apr	139	120	20.4	1.18
28-Apr	140	185	64.4	1.02
28-Apr	141	130	23.5	1.07
28-Apr	142	135	27.7	1.13
28-Apr	143	110	14.0	1.05
28-Apr	144	170	46.3	0.94

PERIOD 1				
Date	Fish	Length	Weight	KC
14-Apr	45	190	63.8	0.93
14-Apr	46	180	55.8	0.96
14-Apr	47	177	50.0	0.90
14-Apr	48	185	52.3	0.83
14-Apr	49	170	45.5	0.93
15-Apr	50	165	48.5	1.08
15-Apr	51	170	46.3	0.94
15-Apr	52	170	49.8	1.01
15-Apr	53	185	60.9	0.96
15-Apr	54	165	40.6	0.90
15-Apr	55	175	42.4	0.79
15-Apr	56	180	53.6	0.92
15-Apr	57	195	65.7	0.89
15-Apr	58	175	52.3	0.98
15-Apr	59	110	15.4	1.16
16-Apr	60	165	42.0	0.93
16-Apr	61	170	49.0	1.00
16-Apr	62	160	41.6	1.02
16-Apr	63	165	42.3	0.94
16-Apr	64	170	46.7	0.95
16-Apr	65	160	29.2	0.71
16-Apr	66	180	53.0	0.91
16-Apr	67	170	48.7	0.99
16-Apr	68	180	58.8	1.01
16-Apr	69	185	58.4	0.92
16-Apr	70	145	31.3	1.03
16-Apr	71	180	37.6	0.64
17-Apr	72	171	25.4	0.51
17-Apr	73	184	30.5	0.49
17-Apr	74	130	11.8	0.54
17-Apr	75	171	25.2	0.50
17-Apr	76	142	15.8	0.55
17-Apr	77	165	24.7	0.55
17-Apr	78	124	10.2	0.53
17-Apr	79	140	16.5	0.60
17-Apr	80	181	32.3	0.54
17-Apr	81	144	16.1	0.54
18-Apr	82	170	49.8	1.01
18-Apr	83	175	53.6	1.00
18-Apr	84	180	55.6	0.95
18-Apr	85	190	76.3	1.11
18-Apr	86	180	54.3	0.93
18-Apr	87	190	63.6	0.93
18-Apr	88	160	42.4	1.04
18-Apr	89	170	49.1	1.00
18-Apr	90	160	47.6	1.16

PERIOD 2				
Date	Fish	Length	Weight	KC
28-Apr	145	130	22.0	1.00
28-Apr	146	130	25.1	1.14
28-Apr	147	110	14.1	1.06
28-Apr	148	135	27.8	1.13
28-Apr	149	170	46.7	0.95
30-Apr	150	175	46.6	0.87
30-Apr	151	170	49.0	1.00
30-Apr	152	135	27.1	1.10
30-Apr	153	135	26.9	1.09
30-Apr	154	135	26.0	1.06
30-Apr	155	130	23.0	1.05
30-Apr	156	190	59.2	0.86
30-Apr	157	115	16.3	1.07
1-May	158	125	20.0	1.02
1-May	159	130	25.0	1.14
1-May	160	160	37.2	0.91
1-May	161	160	37.2	0.91
1-May	162	155	34.8	0.93
1-May	163	130	25.1	1.14
1-May	164	125	21.3	1.09
1-May	165	190	66.9	0.98
1-May	166	140	28.9	1.05
1-May	167	170	48.1	0.98
1-May	168	115	14.1	0.93
1-May	169	130	23.6	1.07
2-May	170	200	77.6	0.97
2-May	171	155	36.3	0.97
2-May	172	155	39.0	1.05
2-May	173	175	48.5	0.90
2-May	174	165	42.5	0.95
2-May	175	185	62.6	0.99
2-May	176	170	45.3	0.92
2-May	177	170	45.4	0.92
2-May	178	120	19.4	1.12
2-May	179	160	43.4	1.06
2-May	180	175	51.6	0.96
2-May	181	180	57.7	0.99
4-May	182	185	41.4	0.65
4-May	183	125	19.3	0.99
4-May	184	137	28.5	1.11
4-May	185	180	32.3	0.55
4-May	186	125	21.2	1.09
4-May	187	180	55.2	0.95
4-May	188	160	38.3	0.94
4-May	189	163	43.3	1.00
4-May	190	130	24.5	1.12

PERIOD 1				
Date	Fish	Length	Weight	KC
18-Apr	91	145	33.7	1.11
18-Apr	92	180	54.8	0.94
18-Apr	93	175	48.4	0.90
18-Apr	94	160	47.4	1.16
18-Apr	95	165	43.2	0.96
20-Apr	96	175	55.4	1.03
20-Apr	97	130	24.2	1.10
20-Apr	98	175	54.2	1.01
20-Apr	99	170	46.3	0.94
20-Apr	100	130	23.3	1.06
Avg		159.5	38.1	0.89
Min		70.0	4.9	0.37
Max		195.0	76.3	1.43
SD		25.9	17.4	0.22

PERIOD 2				
Date	Fish	Length	Weight	KC
4-May	191	132	28.6	1.24
4-May	192	132	23.7	1.03
5-May	193	102	13.4	1.26
5-May	194	101	13.9	1.35
5-May	195	143	30.1	1.03
5-May	196	144	29.9	1.00
5-May	197	130	23.5	1.07
5-May	198	123	20.1	1.08
5-May	199	108	13.0	1.03
5-May	200	125	18.8	0.96
Avg		148.5	35.0	1.02
Min		101.0	13.0	0.55
Max		200.0	77.6	1.39
SD		24.5	15.0	0.13

PERIOD 3				
Date	Fish	Length	Weight	KC
5-May	201	171	42.6	0.85
5-May	202	147	29.0	0.91
5-May	203	155	48.2	1.29
5-May	204	135	27.0	1.10
5-May	205	130	24.6	1.12
5-May	206	105	14.0	1.21
5-May	207	124	22.1	1.16
5-May	208	105	13.4	1.16
5-May	209	132	23.1	1.00
5-May	210	127	22.8	1.11
6-May	211	168	47.4	1.00
6-May	212	124	20.8	1.09
6-May	213	124	20.0	1.05
6-May	214	125	23.6	1.21
6-May	215	140	28.9	1.05
6-May	216	120	21.5	1.24
6-May	217	185	65.0	1.03
6-May	218	166	49.0	1.07
6-May	219	168	55.0	1.16
6-May	220	179	57.0	0.99
6-May	221	130	30.0	1.37
7-May	222	124	25.0	1.31
7-May	223	130	29.0	1.32
7-May	224	138	27.0	1.03
7-May	225	172	46.0	0.90
7-May	226	173	51.0	0.98
7-May	227	167	42.0	0.90
7-May	228	132	24.5	1.07
7-May	229	125	20.6	1.05

PERIOD 4				
Date	Fish	Length	Weight	KC
16-May	301	135	26.8	1.09
18-May	302	135	26.7	1.09
18-May	303	135	27.0	1.10
18-May	304	136	29.8	1.18
18-May	305	135	23.7	0.96
18-May	306	140	28.9	1.05
18-May	307	142	27.5	0.96
18-May	308	140	30.1	1.10
18-May	309	140	28.1	1.02
18-May	310	140	29.1	1.06
18-May	311	142	29.4	1.03
18-May	312	140	27.9	1.02
18-May	313	140	27.5	1.00
19-May	314	143	29.1	1.00
19-May	315	140	27.0	0.98
19-May	316	140	29.2	1.06
19-May	317	140	29.1	1.06
19-May	318	140	29.1	1.06
19-May	319	140	30.9	1.13
19-May	320	145	32.6	1.07
19-May	321	145	31.0	1.02
19-May	322	145	30.6	1.00
19-May	323	145	27.8	0.91
19-May	324	148	30.8	0.95
19-May	325	150	33.6	1.00
19-May	326	150	28.7	0.85
19-May	327	150	33.6	1.00
19-May	328	160	49.9	1.22
19-May	329	170	42.3	0.86

PERIOD 3				
Date	Fish	Length	Weight	KC
7-May	230	135	26.0	1.06
7-May	231	120	18.0	1.04
7-May	232	135	27.1	1.10
7-May	233	123	17.5	0.94
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
8-May	235	135	26.3	1.07
8-May	236	132	26.8	1.17
8-May	237	135	28.2	1.15
8-May	238	133	20.0	0.85
8-May	239	135	27.9	1.13
8-May	240	123	20.1	1.08
8-May	241	145	32.0	1.05
8-May	242	136	27.8	1.11
8-May	243	142	33.5	1.17
8-May	244	160	41.3	1.01
8-May	245	115	18.0	1.18
8-May	246	120	20.8	1.20
8-May	247	118	20.0	1.22
8-May	248	133	24.0	1.02
9-May	249	130	21.7	0.99
9-May	250	121	20.6	1.16
9-May	251	126	22.0	1.10
9-May	252	130	25.6	1.17
9-May	253	140	37.8	1.38
9-May	254	138	30.0	1.14
9-May	255	127	26.2	1.28
9-May	256	125	24.6	1.26
9-May	257	114	16.0	1.08
10-May	258	143	35.0	1.20
10-May	259	140	27.2	0.99
10-May	260	123	25.2	1.35
10-May	261	115	17.8	1.17
10-May	262	150	37.8	1.12
10-May	263	145	30.0	0.98
10-May	264	120	22.0	1.27
10-May	265	117	18.7	1.17
10-May	266	154	37.0	1.01
10-May	267	146	32.0	1.03
10-May	268	135	29.0	1.18
10-May	269	92	11.0	1.41
10-May	270	194	70.5	0.97
10-May	271	153	38.7	1.08
10-May	272	126	22.0	1.10
10-May	273	117	17.4	1.09
10-May	274	103	13.0	1.19
10-May	275	126	24.1	1.20

PERIOD 4				
Date	Fish	Length	Weight	KC
19-May	330	155	34.1	0.92
19-May	331	150	35.4	1.05
19-May	332	155	34.8	0.93
21-May	333	110	14.5	1.09
21-May	334	110	11.4	0.86
21-May	335	110	13.0	0.98
21-May	336	110	17.9	1.34
21-May	337	110	14.0	1.05
21-May	338	110	13.6	1.02
21-May	339	110	16.0	1.20
21-May	340	110	12.3	0.92
21-May	341	110	18.3	1.37
21-May	342	110	16.4	1.23
21-May	343	110	14.6	1.10
21-May	344	110	14.1	1.06
21-May	345	118	18.7	1.14
21-May	346	115	19.1	1.26
21-May	347	115	23.2	1.53
21-May	348	115	17.3	1.14
21-May	349	115	16.5	1.08
22-May	350	115	20.0	1.32
22-May	351	115	18.0	1.18
22-May	352	115	17.0	1.12
22-May	353	115	15.0	0.99
22-May	354	116	17.0	1.09
22-May	355	115	15.0	0.99
22-May	356	115	17.0	1.12
22-May	357	120	18.4	1.06
22-May	358	122	20.0	1.10
22-May	359	120	18.0	1.04
22-May	360	120	19.0	1.10
22-May	361	120	19.0	1.10
22-May	362	120	20.0	1.16
22-May	363	120	20.0	1.16
22-May	364	120	18.0	1.04
22-May	365	120	17.3	1.00
22-May	366	122	20.0	1.10
22-May	367	122	19.0	1.05
22-May	368	120	16.4	0.95
22-May	369	120	17.0	0.98
24-May	370	128	22.0	1.05
24-May	371	126	23.5	1.17
24-May	372	128	20.8	0.99
24-May	373	128	21.0	1.00
24-May	374	125	17.0	0.87
24-May	375	125	20.0	1.02

PERIOD 3				
Date	Fish	Length	Weight	KC
15-May	276	128	14.5	0.69
15-May	277	125	22.5	1.15
15-May	278	125	22.0	1.13
15-May	279	125	23.1	1.18
15-May	280	125	20.0	1.02
15-May	281	125	20.4	1.04
15-May	282	129	22.8	1.06
15-May	283	128	24.0	1.14
15-May	284	125	22.6	1.16
15-May	285	125	19.3	0.99
15-May	286	125	21.5	1.10
15-May	287	125	20.8	1.06
15-May	288	125	17.9	0.92
16-May	289	125	20.6	1.05
16-May	290	134	26.6	1.11
16-May	291	130	22.7	1.03
16-May	292	132	23.4	1.02
16-May	293	130	22.7	1.03
16-May	294	130	22.8	1.04
16-May	295	130	23.6	1.07
16-May	296	130	24.9	1.13
16-May	297	130	22.0	1.00
16-May	298	130	25.5	1.16
16-May	299	135	25.4	1.03
16-May	300	126	21.9	1.09
Avg		135.0	28.5	1.10
Min		92.0	11.0	0.69
Max		255.0	155.3	1.41
SD		21.2	16.7	0.12

PERIOD 4				
Date	Fish	Length	Weight	KC
24-May	376	125	19.0	0.97
24-May	377	128	20.0	0.95
24-May	378	125	20.0	1.02
24-May	379	125	22.0	1.13
24-May	380	125	21.0	1.08
24-May	381	130	22.6	1.03
24-May	382	130	22.6	1.03
24-May	383	125	21.0	1.08
26-May	384	85	7.3	1.19
26-May	385	93	8.1	1.01
26-May	386	90	7.7	1.06
26-May	387	98	9.8	1.04
26-May	388	100	11.0	1.10
26-May	389	100	11.0	1.10
26-May	390	108	13.0	1.03
26-May	391	108	12.0	0.95
26-May	392	105	11.0	0.95
26-May	393	113	12.1	0.84
26-May	394	110	13.9	1.04
26-May	395	112	14.7	1.05
26-May	396	110	12.6	0.95
26-May	397	110	13.6	1.02
26-May	398	115	15.6	1.03
26-May	399	118	17.6	1.07
26-May	400	123	17.5	0.94
Avg		124.5	21.2	1.05
Min		85.0	7.3	0.84
Max		170.0	49.9	1.53
SD		16.1	7.8	0.11

Appendix F. Daily water level and temperature during the fall 2008 adult migration period.

Date	Water Temp (°C)	Air Temp (°C)	Water Level (cm)	Weather Code	Comment
07-Oct	10.0	7.0	100	1	
08-Oct	10.0	6.0	86	1	
09-Oct	10.0	3.0	86	1\2	
10-Oct	10.0	3.0	86	1	
11-Oct	4.0	-1.0	82	1\2	
12-Oct	8.0	8.0	76	1\2	
13-Oct	8.0	8.0	76	2\3	
14-Oct	8.0	9.0	76	1\2	
15-Oct	7.0	8.0	75	1\2	Air temp -1 to 8
16-Oct	8.0	6.0	76	3	
17-Oct	8.8	10.1	87	2	Water level up, overnight rain
18-Oct	7.0	2.0	91	1	
19-Oct	6.8	3.8	92	2	
20-Oct	6.9	6.4	85	1\2	1 Chum
21-Oct	6.9	2.6	84	1\2	
22-Oct	6.0	2.4	86	1	
23-Oct	6.9	5.0	90	1	
24-Oct	7.0	6.0	86	1\2	Sunny AM Rain PM
25-Oct	7.9	6.0	86	1	Sunny AM
26-Oct	7.1	1.0	82	1	Sunny low flow
27-Oct	7.1	-1.0	88	1	Sunny
28-Oct	6.9	0.0	88	1\2	1\2 Overcast
29-Oct	6.4	9.4	60	2	Overcast
30-Oct	7.0	9.5	92	2	Overcast
31-Oct	6.9	9.0	120	2	
01-Nov	9.0	10.1	115	2	
02-Nov	9.1	9.6	150	2	High water levels at fence
03-Nov	7.4	3.7	138	2	
04-Nov	7.1	5.8	130	1	
05-Nov	5.9	0.7	126	2	
06-Nov	6.4	7.1	130	3	
07-Nov	7.4	9.3	120	3	
08-Nov	9.0	11.4	180	3	Over Fence Today
09-Nov	9.2	9.7	182	2	Over Fence Today
10-Nov	8.9	5.0	184	2	Over Fence Today
11-Nov	8.9	7.0	130	2	Rain & Wind
12-Nov	8.6	9.0	128	2	
13-Nov	8.8	6.0	122	1	
14-Nov	7.9	6.9	128	2	
15-Nov	8.3	9.5	122	3	
18-Nov	8.1	7.2	128	1	Level Dropping Below Gate

Appendix G. Adult coho data, Black Creek fall fence, 2008.

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
7-Oct	M	2	56	Y	Yellow	201	80516	1	
7-Oct	F	1	57	Y	Yellow	202	80516	2	
7-Oct	J	1	31	N	Yellow				
7-Oct	M	1	65	N	Yellow	203	80516	3	
7-Oct	J	1	36	N	Yellow				
7-Oct	J	1	37	N	Yellow				
7-Oct	F	1	67	Y	Yellow	204	80516	4	
7-Oct	J	1	35	N	Yellow				
7-Oct	J	1	35	N	Yellow				
7-Oct	J	1	34	N	Yellow				
7-Oct	J	1	33	N	Yellow				
7-Oct	J	1	35	N	Yellow				
7-Oct	M	1	70	N	Yellow	205	80516	5	
7-Oct	J	1	37	N	Yellow				
7-Oct	J	1	37	N	Yellow				
7-Oct	J	1	37	N	Yellow				
7-Oct	J	1	35	Y	Yellow				
7-Oct	J	1	30	N	Yellow				
7-Oct	J	1	30	N	Yellow				
7-Oct	F	1	57	N	Yellow	207	80516	6	206 WASTED
7-Oct	J	1	37	Y	Yellow				
7-Oct	J	1	35	N	Yellow				
7-Oct	F	1	70	N	Yellow	208	80516	7	
7-Oct	M	1	65	N	Yellow	209	80516	8	
7-Oct	M	1	75	N	Yellow	210	80516	9	
8-Oct	J	1	30	N	Yellow				
8-Oct	J	1	30	N	Yellow				
17-Oct	M	2	77	N	Yellow	211			
17-Oct	F	2	76	N	Yellow	212			
17-Oct	J	2	37	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	F	2	70	N	Yellow	213			
17-Oct	J	2	35	N	Yellow				
17-Oct	J	2	37	N	Yellow				
17-Oct	J	2	35	N	Yellow				
17-Oct	J	2	37	N	Yellow				
17-Oct	M	2	68	N	Yellow	214			
17-Oct	J	2	32	N	Yellow				
17-Oct	J	2	32	N	Yellow				
17-Oct	J	2	37	N	Yellow				
17-Oct	J	2	33	N	Yellow				
17-Oct	J	2	32	Y	Yellow				
17-Oct	J	2	35	N	Yellow				
17-Oct	F	2	59	N	Yellow	215			
17-Oct	J	2	33	N	Yellow				
17-Oct	M	2	75	N	Yellow	216			
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	28	N	Yellow				
17-Oct	J	2	36	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	26	Y	Yellow				
17-Oct	J	2	35	N	Yellow				2 Cutthroat
17-Oct	F	2	67	N	Yellow	265			
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	37	N	Yellow				
17-Oct	F	2	65	N	Yellow	266			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
17-Oct	M	1	66	N	Yellow	269			267/268 WASTED
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	32	N	Yellow				
17-Oct	F	1	61	N	Yellow	273			270/271/272 WASTED
17-Oct	J	2	29	-	Yellow				
17-Oct	J	2	26	-	Yellow				
17-Oct	J	2	32	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	F	2	50	N	Yellow	260			
17-Oct	J	2	36	N	Yellow				
17-Oct	F	2	56	N	Yellow	261			
17-Oct	F	2	70	N	Yellow	262			
17-Oct	J	2	29	N	Yellow				
17-Oct	F	2	63	N	Yellow				Unable to Tag
17-Oct	J	1	31	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	28	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	J	2	26	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	27	N	Yellow				5 Cutthroat
17-Oct	F	2	50	N	Yellow	264			263 WASTED
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	J	2	26	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	J	2	28	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	F	2	75	N	Yellow	247			
17-Oct	M	2	69	N	Yellow	248			
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	F	2	61	N	Yellow	250			249 WASTED
17-Oct	F	2	60	N	Yellow	251			
17-Oct	F	2	60	N	Yellow	252			
17-Oct	J	2	26	N	Yellow				
17-Oct	M	2	78	N	Yellow	253			
17-Oct	M	2	79	N	Yellow	254			
17-Oct	J	2	25	N	Yellow				
17-Oct	M	2	79	Y	Yellow	255			
17-Oct	F	1	67	N	Yellow	256			
17-Oct	F	1	67	N	Yellow	257			
17-Oct	F	2	69	N	Yellow	258			
17-Oct	J	2	37	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	3	30	N	Yellow				
17-Oct	J	2	28	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	J	3	35	N	Yellow				
17-Oct	J	1	36	N	Yellow				
17-Oct	J	2	36	N	Yellow				
17-Oct	J	2	34	N	Yellow				
17-Oct	J	2	32	N	Yellow				
17-Oct	F	2	67	N	Yellow	244			
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	36	N	Yellow				
17-Oct	M	3	70	N	Yellow	245			
17-Oct	J	2	31	N	Yellow				

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
17-Oct	J	2	29	N	Yellow				
17-Oct	F	2	47	N	Yellow	246			
17-Oct	J	2	31	N	Yellow				
17-Oct	F	2	69	N	Yellow	236			
17-Oct	M	2	71	N	Yellow	237			
17-Oct	M	2	76	N	Yellow	238			Lively Predator Scar
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	M	2	61	N	Yellow	239			
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	M	2	76	N	Yellow	240			
17-Oct	M	2	70	N	Yellow	241			
17-Oct	J	2	35	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	32	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	28	N	Yellow				
17-Oct	J	2	27	N	Yellow				
17-Oct	J	2	34	-	Yellow				
17-Oct	J	2	29	-	Yellow				
17-Oct	M	2	66	N	Yellow	228			
17-Oct	J	2	30	N	Yellow				
17-Oct	F	2	64	N	Yellow	229			
17-Oct	J	2	33	N	Yellow				
17-Oct	F	2	72	N	Yellow				Unable to Tag
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	F	2	70	N	Yellow	230			
17-Oct	J	2	36	N	Yellow				
17-Oct	J	2	29	Y	Yellow				
17-Oct	F	2	67	N	Yellow	231			
17-Oct	J	2	31	N	Yellow				
17-Oct	F	2	66	N	Yellow	232			
17-Oct	J	3	31	N	Yellow				
17-Oct	J	2	28	N	Yellow				
17-Oct	F	2	70	N	Yellow	234			233 WASTED
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	M	2	71	N	Yellow	235			
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	34	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	34	N	Yellow				
17-Oct	J	2	34	Y	Yellow				
17-Oct	F	2	68	N	Yellow	223			
17-Oct	J	2	32	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	F	2	63	N	Yellow	224			8 Cutthroats
17-Oct	F	2	61	N	Yellow	225			
17-Oct	J	2	37	N	Yellow				
17-Oct	J	2	26	N	Yellow				
17-Oct	F	2	68	N	Yellow	227			
17-Oct	J	2	33	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	33	N	Yellow				
17-Oct	J	2	35	N	Yellow				
17-Oct	M	2	77	N	Yellow	217			
17-Oct	J	2	31	N	Yellow				

Sample Date	Sex	Condition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
17-Oct	J	2	33	N	Yellow				
17-Oct	F	2	56	N	Yellow	218			
17-Oct	F	1	45	N	Yellow	219			
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	36	N	Yellow				
17-Oct	F	2	76	N	Yellow	220			
17-Oct	F	2	72	N	Yellow	221			
17-Oct	J	2	35	N	Yellow				
17-Oct	J	2	33	N	Yellow				
17-Oct	J	2	36	N	Yellow				
17-Oct	J	2	32	N	Yellow				
17-Oct	J	2	33	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	F	2	65	N	Yellow	222			
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	31	N	Yellow				
17-Oct	J	2	30	N	Yellow				
17-Oct	F	1	62	N	Yellow	274			1-Cutthroat
17-Oct	F	2	74	N	Yellow	275			Predator Scar
17-Oct	F	1	60	N	Yellow	276			
17-Oct	F	2	71	N	Yellow	277			
17-Oct	F	1	58	N	Yellow	278			
17-Oct	J	2	31	N	Yellow				
17-Oct	M	2	58	N	Yellow	279			
17-Oct	J	2	32	N	Yellow				
17-Oct	M	2	70	N	Yellow	281			280 WASTED
17-Oct	J	2	30	N	Yellow				
17-Oct	J	2	29	N	Yellow				
17-Oct	J	2	33	N	Yellow				
17-Oct	M	2	79	N	Yellow				
17-Oct	M	2	69	N	Yellow				
17-Oct	M	1	80	N	Yellow				
17-Oct	J	2	27	N	Yellow				
18-Oct	J	2	36	N	Yellow	286	80516	10	
18-Oct	M	2	75	N	Yellow	287	80517	1	
18-Oct	M	2	65	N	Yellow				
31-Oct	J	2	37	N	Yellow				
31-Oct	M	2	65	N	Yellow	288			
31-Oct	J	2	32	N	Yellow				
31-Oct	J	2	34	N	Yellow				
31-Oct	J	2	36	N	Yellow				
31-Oct	J	2	38	N	Yellow				
31-Oct	J	2	36	Y	Yellow				
31-Oct	J	2	37	N	Yellow				
31-Oct	J	2	38	N	Yellow				
31-Oct	J	1	32	-	Yellow				
31-Oct	F	2	80	N	Yellow	291			290 WASTED
31-Oct	J	2	42	N	Yellow				
31-Oct	J	2	34	N	Yellow				
31-Oct	J	2	31	N	Yellow				
31-Oct	J	2	34	N	Yellow				
31-Oct	J	2	34	N	Yellow				1 Trout Escaped
31-Oct	M	2	66	-	Yellow				
31-Oct	J	2	37	-	Yellow				
31-Oct	J	2	38	N	Yellow				
31-Oct	J	2	34	N	Yellow				
31-Oct	M	2	65	N	Yellow	294			292/293 WASTED
31-Oct	F	2	64	N	Yellow	295			
31-Oct	J	2	40	N	Yellow				
31-Oct	M	3	70	N	Yellow	296			
31-Oct	J	2	33	N	Yellow				
31-Oct	J	2	34	N	Yellow				1 Trout
31-Oct	M	3	55	N	Yellow	298	80518	1	

Sample Date	Sex	Cond- ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
31-Oct	M	3	60	N	Yellow	299	80518	2	
31-Oct	J	2	39	N	Yellow				
31-Oct	M	3	70	-	Yellow	300	80518	3	1 Trout
31-Oct	F	3	68	N	Yellow	301	80518	4	
31-Oct	F	3	65	N	Yellow	302	80518	5	
31-Oct	M	2	75	Y	Yellow	303	80518	6	
31-Oct	F	2	76	Y	Yellow	304	80518	7	
31-Oct	M	2	69	N	Yellow	305	80518	8	
31-Oct	F	2	69	N	Yellow	306	80518	9	
31-Oct	M	2	78	N	Yellow	308	80518	10	307 WASTED
31-Oct	M	2	71	N	Yellow	310			309 WASTED
31-Oct	M	2	67	N	Yellow	312			311 WASTED
31-Oct	J	2	37	N	Yellow				
31-Oct	F	2	66	N	Yellow	313			
31-Oct	F	2	72	-	Yellow	317			314/315/316 WASTED
31-Oct	F	2	78	N	Yellow	318			
31-Oct	F	2	74	N	Yellow	319			
31-Oct	M	2	64	N	Yellow	320			
31-Oct	F	2	71	N	Yellow	321			
31-Oct	F	2	75	N	Yellow	322			
31-Oct	M	2	76	N	Yellow	324			323 WASTED
31-Oct	F	2	64	Y	Yellow	325			
31-Oct	F	2	65	N	Yellow	326			
31-Oct	M	2	75	N	Yellow	327			
31-Oct	F	2	72	N	Yellow	328			
31-Oct	F	2	65	N	Yellow	329			
31-Oct	M	2	75	N	Yellow	330			
31-Oct	M	2	68	N	Yellow	331			
31-Oct	M	2	70	N	Yellow	332			
31-Oct	F	2	75	Y	Yellow	333			
31-Oct	F	2	75	N	Yellow	334			
31-Oct	J	2	36	N	Yellow				
31-Oct	J	2	35	N	Yellow				
31-Oct	J	2	32	N	Yellow				
31-Oct	F	2	74	N	Yellow	335			Trout- Predator Marks
31-Oct	J	2	40	N	Yellow				
31-Oct	M	2	74	N	Yellow	336			
31-Oct	F	2	77	N	Yellow	337			
31-Oct	F	2	69	N	Yellow	338			
31-Oct	F	2	68	N	Yellow	340			339 WASTED
31-Oct	M	2	70	N	Yellow	341			
31-Oct	J	2	34	N	Yellow				
31-Oct	J	2	32	N	Yellow				
31-Oct	F	2	70	N	Yellow	342			
31-Oct	M	2	77	N	Yellow	343			
31-Oct	F	2	75	N	Yellow	344			
31-Oct	M	2	81	N	Yellow	345			
31-Oct	M	2	63	N	Yellow	346			
31-Oct	M	2	76	N	Yellow	347			
31-Oct	M	2	79	N	Yellow	348			
31-Oct	M	2	83	N	Yellow	349			
31-Oct	F	2	70	N	Yellow	350			
31-Oct	M	2	71	N	Yellow	351			
31-Oct	F	2	71	N	Yellow	352			
31-Oct	F	2	72	N	Yellow	353			
31-Oct	M	2	83	N	Yellow	355			354 WASTED
31-Oct	F	1	70	N	Yellow	356			
31-Oct	M	1	66	N	Yellow	357			
31-Oct	M	2	76	N	Yellow	358			
31-Oct	F	2	79	-	Yellow	359			
31-Oct	M	2	63	N	Yellow	360			
31-Oct	F	2	70	N	Yellow	361			
31-Oct	F	2	73	N	Yellow	362			
31-Oct	M	2	76	N	Yellow	363			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
31-Oct	M	2	77	-	Yellow	364			
31-Oct	M	2	78	N	Yellow	365			TUMOUR
31-Oct	M	2	72	N	Yellow	367			366 WASTED
31-Oct	F	2	67	N	Yellow	368			
31-Oct	M	2	80	N	Yellow	369			
31-Oct	M	2	78	-	Yellow	371			370 WASTED
31-Oct	M	2	74	N	Yellow	372			
31-Oct	J	2	36	-	Yellow				
31-Oct	M	2	60	N	Yellow	373			
31-Oct	J	2	38	-	Yellow				
31-Oct	M	2	82	N	Yellow	374			
31-Oct	J	2	36	-	Yellow				
31-Oct	J	2	38	-	Yellow				
31-Oct	M	2	71	N	Yellow	375			
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	40	-	Yellow				
31-Oct	M	2	65	N	Yellow	376			
31-Oct	J	2	39	-	Yellow				
31-Oct	J	2	32	-	Yellow				
31-Oct	J	2	36	-	Yellow				1 Trout
31-Oct	F	2	75	N	Yellow	377			
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	40	-	Yellow				
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	36	-	Yellow				
31-Oct	J	2	36	-	Yellow				
31-Oct	F	2	69	N	Yellow	378			
31-Oct	J	2	40	-	Yellow				
31-Oct	J	2	38	-	Yellow				
31-Oct	M	1	60	N	Yellow	379			
31-Oct	M	2	70	Y	Yellow	380			
31-Oct	F	2	74	N	Yellow	381			
31-Oct	J	2	40	-	Yellow				
31-Oct	J	2	36	-	Yellow				
31-Oct	J	2	37	-	Yellow				
31-Oct	M	2	67	N	Yellow	383			382 WASTED
31-Oct	J	2	41	-	Yellow				
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	38	-	Yellow				
31-Oct	F	2	76	-	Yellow	387			384/385/386 WASTED
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	37	-	Yellow				
31-Oct	J	2	42	-	Yellow				
31-Oct	J	2	39	-	Yellow				
31-Oct	F	2	68	N	Yellow	389			388 WASTED
31-Oct	J	2	35	-	Yellow				
31-Oct	J	2	32	-	Yellow				
31-Oct	J	2	35	-	Yellow				
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	36	-	Yellow				
31-Oct	J	2	34	-	Yellow				
31-Oct	J	2	35	-	Yellow	391			390 WASTED
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	38	-	Yellow				
31-Oct	J	2	40	-	Yellow				
31-Oct	J	2	37	-	Yellow				
31-Oct	J	2	35	-	Yellow				
31-Oct	J	2	32	-	Yellow				
31-Oct	F	2	52	N	Yellow	392			
31-Oct	J	2	37	-	Yellow				
31-Oct	J	2	33	-	Yellow				
31-Oct	F	2	69	N	Yellow	393			
31-Oct	J	2	42	-	Yellow				
31-Oct	J	2	40	-	Yellow				

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
31-Oct	J	2	42	-	Yellow				
31-Oct	J	2	37	-	Yellow				
31-Oct	J	2	40	-	Yellow				
31-Oct	J	1	39	-	Yellow				
31-Oct	J	1	38	-	Yellow				
31-Oct	J	2	37	-	Yellow				
31-Oct	M	2	58	N	Yellow	394			
31-Oct	F	2	76	N	Yellow	395			
31-Oct	M	2	76	N	Yellow	396			
31-Oct	J	1	37	-	Yellow				
31-Oct	J	1	38	-	Yellow				
31-Oct	J	1	37	-	Yellow				
31-Oct	F	2	73	N	Yellow	397			
31-Oct	-	2	61	N	Yellow				
31-Oct	M	2	83	N	Yellow	398			
31-Oct	F	2	74	N	Yellow	399			
31-Oct	M	2	69	-	Yellow	400			
31-Oct	J	1	37	-	Yellow				
31-Oct	F	2	68	N	Yellow	401			
31-Oct	M	2	77	N	Yellow	402			
31-Oct	M	2	72	N	Yellow	404			403 WASTED
31-Oct	J	2	36	-	Yellow				
31-Oct	F	2	76	N	Yellow	405			
31-Oct	J	2	38	-	Yellow				
31-Oct	F	2	79	N	Yellow	407			406 WASTED
31-Oct	J	2	37	-	Yellow				
31-Oct	F	2	70	N	Yellow	409			
31-Oct	M	2	80	N	Yellow	411			410 WASTED
31-Oct	M	2	77	N	Yellow	413			412 WASTED
31-Oct	J	2	35	-	Yellow				
31-Oct	F	2	70	N	Yellow	414			
31-Oct	M	2	76	-	Yellow	415			
31-Oct	F	2	78	N	Yellow	417			416 WASTED
31-Oct	F	2	77	N	Yellow	418			
31-Oct	M	2	71	N	Yellow	419			
31-Oct	M	2	81	N	Yellow	421			420 WASTED
31-Oct	J	2	37	-	Yellow				
31-Oct	F	2	75	-	Yellow	422			
31-Oct	F	2	76	-	Yellow	424			423 WASTED
31-Oct	F	1	73	-	Yellow	454			
1-Nov	J	2	36	N	Yellow				
1-Nov	F	2	73	N	Yellow	426	80519	1	
1-Nov	F	2	77	N	Yellow	427	80519	2	
1-Nov	F	2	72	N	Yellow	429	80519	3	428 WASTED
1-Nov	F	2	73	N	Yellow	430	80519	4	
1-Nov	M	2	75	N	Yellow	431	80519	5	
1-Nov	M	2	53	N	Yellow	432	80519	6	
1-Nov	F	2	68	N	Yellow	433	80519	7	
1-Nov	F	2	75	N	Yellow	434	80519	8	
1-Nov	M	2	76	N	Yellow	435	80519	9	
1-Nov	F	2	77	N	Yellow	436	80519	10	
1-Nov	F	2	73	N	Yellow	437			
1-Nov	M	2	81	N	Yellow	445			438-444 WASTED
1-Nov	M	2	70	N	Yellow	446			
1-Nov	F	2	70	N	Yellow	447			
1-Nov	M	2	73	N	Yellow				Not Tagged
1-Nov	F	2	73	N	Yellow	448			
1-Nov	F	2	74	N	Yellow	449			
1-Nov	F	2	75	Y	Yellow	450			
1-Nov	F	2	78	N	Yellow	452			451 WASTED
1-Nov	F	2	69	N	Yellow	453			
1-Nov	F	2	72	N	Yellow	454			
1-Nov	F	2	68	N	Yellow	455			
1-Nov	M	2	77	N	Yellow	456			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
1-Nov	F	2	72	N	Yellow	457			
1-Nov	F	2	69	N	Yellow	458			
1-Nov	M	2	59	N	Yellow	459			
1-Nov	M	2	72	Y	Yellow	460			
1-Nov	M	2	74	N	Yellow	461			
1-Nov	F	2	73	N	Yellow	462			
1-Nov	M	2	75	N	Yellow	463			
1-Nov	M	2	73	N	Yellow	464			
1-Nov	F	2	71	Y	Yellow	465			
1-Nov	M	2	81	N	Yellow	466			467/468 WASTED
1-Nov	M	2	49	Y	Yellow	469			
1-Nov	J	2	42	N	Yellow				
1-Nov	M	3	86	N	Yellow	470			
1-Nov	J	2	39	N	Yellow				
1-Nov	F	2	67	N	Yellow	471			
1-Nov	J	2	35	N	Yellow				
1-Nov	J	2	43	N	Yellow				
1-Nov	M	2	87	N	Yellow	472			
1-Nov	M	2	75	N	Yellow	473			
1-Nov	F	2	66	N	Yellow	474			
1-Nov	F	2	72	N	Yellow	475			
1-Nov	F	1	63	N	Yellow	476			
1-Nov	F	2	78	N	Yellow	477			
1-Nov	M	2	71	N	Yellow	478			
1-Nov	J	2	35	N	Yellow				
1-Nov	M	2	71	N	Yellow	479			
1-Nov	F	2	82	N	Yellow	480			
1-Nov	J	2	32	N	Yellow				
1-Nov	M	2	77	N	Yellow	481			
1-Nov	J	2	36	N	Yellow				
1-Nov	M	2	80	N	Yellow	482			
1-Nov	F	2	81	N	Yellow	483			
1-Nov	M	2	73	N	Yellow	484			
1-Nov	F	2	70	N	Yellow	485			
1-Nov	F	1	75	N	Yellow	486			
1-Nov	M	2	80	N	Yellow	487			
1-Nov	J	2	40	N	Yellow				
1-Nov	M	2	81	N	Yellow	488			
1-Nov	M	2	78	N	Yellow	489			
1-Nov	F	2	66	N	Yellow	490			
1-Nov	F	1	62	N	Yellow	491			
1-Nov	M	2	73	N	Yellow	492			
1-Nov	F	3	69	Y	Yellow	493			
1-Nov	F	2	74	N	Yellow	494			
1-Nov	M	3	59	N	Yellow	495			
1-Nov	M	2	74	N	Yellow	496			
1-Nov	F	2	76	N	Yellow	497			
1-Nov	F	2	75	N	Yellow	498			
1-Nov	F	2	73	N	Yellow	499			
1-Nov	M	2	74	N	Yellow	500			
1-Nov	F	2	76	N	Yellow	501			
1-Nov	J	2	43	N	Yellow				
1-Nov	J	2	35	N	Yellow				
1-Nov	J	2	31	N	Yellow				
1-Nov	F	2	73	N	Yellow	502			
1-Nov	F	2	76	N	Yellow	503			
1-Nov	J	2	35	N	Yellow				
1-Nov	J	2	36	N	Yellow				
1-Nov	F	2	68	N	Yellow	505			
1-Nov	M	2	70	N	Yellow	506			
1-Nov	M	2	66	N	Yellow	507			
1-Nov	M	3	76	N	Yellow	508			
1-Nov	F	1	73	N	Yellow	509			
1-Nov	M	2	78	N	Yellow	510			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
1-Nov	F	2	70	N	Yellow	511			
1-Nov	F	3	71	N	Yellow	512			
1-Nov	J	2	30	N	Yellow				
1-Nov	J	2	33	N	Yellow				
1-Nov	M	2	58	N	Yellow	513			
1-Nov	J	2	34	N	Yellow				
1-Nov	J	2	35	N	Yellow				
1-Nov	J	2	32	N	Yellow				
1-Nov	M	2	76	N	Yellow	514			
1-Nov	F	2	78	N	Yellow	515			Predator Marks
1-Nov	M	2	79	N	Yellow	516			
1-Nov	F	2	76	N	Yellow	517			Predator Marks
1-Nov	J	2	24	N	Yellow				
1-Nov	J	1	38	N	Yellow				
1-Nov	J	2	36	N	Yellow				
1-Nov	F	2	68	N	Yellow	518			
1-Nov	M	2	74	N	Yellow	519			
1-Nov	J	2	34	N	Yellow				
1-Nov	F	2	73	N	Yellow	520			
1-Nov	J	2	34	N	Yellow				
1-Nov	F	2	76	N	Yellow	521			
1-Nov	J	2	31	N	Yellow				
1-Nov	F	3	71	N	Yellow	522			
1-Nov	J	2	29	N	Yellow				
1-Nov	F	2	55	-	Yellow	523			
1-Nov	J	2	32	N	Yellow				
1-Nov	M	2	56	N	Yellow	524			
1-Nov	M	2	74	N	Yellow	525			
1-Nov	M	2	80	N	Yellow	526			Predator Marks
1-Nov	F	2	65	N	Yellow	527			
1-Nov	M	2	67	Y	Yellow	528	80520	1	
1-Nov	J	2	35	N	Yellow				
1-Nov	J	2	36	N	Yellow				
1-Nov	J	2	32	N	Yellow				
1-Nov	F	2	76	N	Yellow	529	80520	2	
1-Nov	J	2	37	N	Yellow				
1-Nov	M	2	75	N	Yellow	531	80520	3	530 WASTED
1-Nov	M	2	78	-	Yellow	532	80520	4	Predator Marks
1-Nov	J	2	33	N	Yellow				
1-Nov	F	2	54	N	Yellow	533	80520	5	
1-Nov	M	2	62	N	Yellow	534	80520	6	
1-Nov	J	2	43	N	Yellow				
1-Nov	J	2	42	N	Yellow				
1-Nov	J	2	37	N	Yellow				
1-Nov	J	2	33	N	Yellow				
1-Nov	F	2	75	N	Yellow	535	80520	7	
1-Nov	M	2	81	N	Yellow	536	80520	8	
1-Nov	F	2	70	N	Yellow	537	80520	9	
1-Nov	J	2	38	N	Yellow				
1-Nov	J	2	39	N	Yellow				
1-Nov	F	2	72	N	Yellow	538	80520	10	
1-Nov	M	2	76	N	Yellow	539			
1-Nov	M	2	68	N	Yellow	540			
1-Nov	F	2	67	N	Yellow	541			
1-Nov	M	2	81	N	Yellow	542			
1-Nov	J	2	37	N	Yellow				
1-Nov	J	1	37	N	Yellow				
1-Nov	F	2	75	N	Yellow	543			Predator Marks
1-Nov	F	2	74	N	Yellow	544			
1-Nov	M	2	71	N	Yellow	545			
1-Nov	F	2	72	N	Yellow	546			
1-Nov	J	2	34	N	Yellow				
1-Nov	F	2	65	Y	Yellow	547			
1-Nov	J	2	33	N	Yellow				

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
1-Nov	M	2	75	N	Yellow	548			
1-Nov	F	2	77	N	Yellow	549			
1-Nov	J	2	26	N	Yellow				
1-Nov	J	2	29	N	Yellow				
1-Nov	M	2	73	N	Yellow	550			
1-Nov	F	2	65	N	Yellow	551			
1-Nov	F	2	64	N	Yellow	552			
1-Nov	M	2	83	N	Yellow	553			
1-Nov	M	2	68	N	Yellow	554			
1-Nov	M	3	62	N	Yellow	556			555 WASTED
1-Nov	J	2	35	N	Yellow				
1-Nov	M	2	83	N	Yellow	557			
1-Nov	F	2	63	N	Yellow	558			
1-Nov	J	2	26	N	Yellow				
1-Nov	J	2	39	N	Yellow				
1-Nov	M	2	79	N	Yellow	561			559/560 WASTED
1-Nov	J	2	40	N	Yellow				
1-Nov	J	2	36	N	Yellow				
1-Nov	J	2	38	N	Yellow				
1-Nov	J	2	37	N	Yellow				
1-Nov	J	2	42	N	Yellow				
1-Nov	J	2	35	N	Yellow				
1-Nov	J	2	27	N	Yellow				
1-Nov	F	2	64	Y	Yellow	562			
1-Nov	J	2	36	N	Yellow				
1-Nov	J	2	36	N	Yellow				
1-Nov	F	2	72	N	Yellow	563			
1-Nov	F	2	71	N	Yellow	564			
1-Nov	M	2	84	N	Yellow	565			
1-Nov	F	2	69	N	Yellow	566			
1-Nov	J	2	34	N	Yellow				
1-Nov	M	2	54	N	Yellow	567			
1-Nov	F	2	70	N	Yellow	569			568 WASTED
1-Nov	F	2	60	N	Yellow	570			
1-Nov	J	2	39	N	Yellow				
1-Nov	F	2	77	N	Yellow	571			
1-Nov	J	2	38	N	Yellow				
1-Nov	M	2	75	N	Yellow	572			
1-Nov	J	2	31	N	Yellow				
1-Nov	J	2	27	N	Yellow				
1-Nov	F	2	79	N	Yellow	573			
1-Nov	J	2	28	N	Yellow				
1-Nov	M	2	67	Y	Yellow	574			
1-Nov	M	2	78	N	Yellow	575			
1-Nov	F	2	71	N	Yellow	576			
1-Nov	F	3	71	Y	Yellow	577			
1-Nov	F	1	62	Y	Yellow	578			
1-Nov	F	2	74	N	Yellow	579			
1-Nov	F	2	72	N	Yellow	580			
1-Nov	F	2	40	Y	Yellow				
2-Nov	M	3	82	N	Yellow	581			
2-Nov	F	3	58	N	Yellow	582			
2-Nov	J	3	35	N	Yellow				
2-Nov	M	3	81	N	Yellow	583			
2-Nov	F	3	69	N	Yellow	585			
2-Nov	J	3	35	N	Yellow				
2-Nov	M	3	74	N	Yellow	586			
2-Nov	M	3	70	N	Yellow	587			
2-Nov	M	3	80	N	Yellow	588			
2-Nov	F	2	72	N	Yellow	589			Condition originally listed as "1\2"
2-Nov	M	3	80	N	Yellow	590			
2-Nov	F	3	67	Y	Yellow	591			
2-Nov	M	3	82	N	Yellow	592			
2-Nov	F	1	73	N	Yellow	593			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
2-Nov	M	3	75	N	Yellow	594			
2-Nov	M	3	72	Y	Yellow	595			
2-Nov	F	2	79	N	Yellow	596			
2-Nov	M	3	77	N	Yellow	597			
2-Nov	F	2	78	N	Yellow	599			598 WASTED
2-Nov	M	3	77	N	Yellow	600			
2-Nov	F	2	58	N	Yellow	601			
2-Nov	M	3	77	N	Yellow	602			
2-Nov	F	2	73	N	Yellow	603			
2-Nov	M	2	74	Y	Yellow	604			
2-Nov	J	-	35	N	Yellow				
2-Nov	M	2	64	N	Yellow	605			
2-Nov	M	3	73	N	Yellow	606			
2-Nov	M	1	69	Y	Yellow	608			607 WASTED
2-Nov	F	2	59	N	Yellow	609			
2-Nov	M	3	85	N	Yellow	610			
2-Nov	F	3	73	N	Yellow	611			
2-Nov	M	3	69	N	Yellow	612			
2-Nov	F	3	77	N	Yellow	613			
2-Nov	M	3	78	N	Yellow	614			
2-Nov	F	2	75	N	Yellow	615			
2-Nov	M	3	80	N	Yellow	617			616 WASTED
2-Nov	J	1	32	N	Yellow				
2-Nov	F	3	77	N	Yellow	618			
2-Nov	M	3	69	N	Yellow	619			
2-Nov	M	2	83	N	Yellow	620			
2-Nov	F	1	64	N	Yellow	621			
2-Nov	F	3	73	N	Yellow	622			
2-Nov	F	2	74	N	Yellow	623			
2-Nov	F	3	70	N	Yellow	624			
2-Nov	M	3	69	N	Yellow	625			
2-Nov	J	1	27	N	Yellow				
2-Nov	F	3	76	N	Yellow	626			Loose Eggs
2-Nov	M	3	77	N	Yellow	627			Predator Marks
2-Nov	F	3	76	N	Yellow	628			
2-Nov	M	3	73	N	Yellow	629			
2-Nov	F	3	69	N	Yellow	630			
2-Nov	M	3	73	N	Yellow	631			
2-Nov	F	3	77	N	Yellow	632			
2-Nov	F	2	73	Y	Yellow	633			
2-Nov	M	3	69	N	Yellow	634			
2-Nov	M	3	75	N	Yellow	635			
2-Nov	M	3	74	N	Yellow	636			
2-Nov	F	2	77	N	Yellow	637			
2-Nov	F	3	75	N	Yellow	638			
2-Nov	F	3	64	Y	Yellow	639			
2-Nov	M	3	75	N	Yellow	640			
2-Nov	J	1	30	N	Yellow				
2-Nov	F	2	80	N	Yellow	641			
2-Nov	J	2	26	N	Yellow				
2-Nov	F	3	54	N	Yellow	642			
2-Nov	F	3	74	N	Yellow	643			
2-Nov	F	1	76	N	Yellow	644			
2-Nov	M	3	81	N	Yellow	645			
2-Nov	F	2	73	N	Yellow	646			
2-Nov	F	1	67	N	Yellow	647			
2-Nov	M	3	79	N	Yellow	648			
2-Nov	F	2	79	N	Yellow	649			
2-Nov	F	3	72	N	Yellow	650			
2-Nov	M	3	77	N	Yellow	651			
2-Nov	F	3	68	N	Yellow	652			
2-Nov	M	2	71	N	Yellow	653			
2-Nov	F	3	75	N	Yellow	654			
2-Nov	F	2	52	N	Yellow	655			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
2-Nov	M	3	72	N	Yellow	656	80521	1	
2-Nov	M	2	71	N	Yellow	657	80521	2	
2-Nov	F	2	75	N	Yellow	658	80521	3	
2-Nov	F	3	77	N	Yellow	659	80521	4	
2-Nov	M	3	74	N	Yellow	660	80521	5	
2-Nov	F	2	61	Y	Yellow	661	80521	6	
2-Nov	M	3	75	N	Yellow	662	80521	7	
2-Nov	F	3	73	N	Yellow	663			
2-Nov	F	2	72	N	Yellow	664	80521	8	
2-Nov	F	1	75	N	Yellow	666	80521	9	665 WASTED
2-Nov	F	2	80	N	Yellow	667	80521	10	
2-Nov	M	2	78	N	Yellow	668			
2-Nov	F	3	68	N	Yellow	670			669 WASTED
2-Nov	M	3	61	N	Yellow	671			
2-Nov	M	3	70	N	Yellow	672			
2-Nov	M	2	69	N	Yellow	673			
2-Nov	F	2	70	N	Yellow	674			
2-Nov	F	2	67	N	Yellow	675			
2-Nov	F	2	70	N	Yellow	676			
2-Nov	F	2	81	N	Yellow	677			
2-Nov	M	3	78	Y	Yellow	678			
2-Nov	M	3	81	N	Yellow	679			
2-Nov	M	3	78	N	Yellow	680			
2-Nov	F	3	76	N	Yellow	681			
2-Nov	M	3	84	N	Yellow	682			
2-Nov	M	2	81	N	Yellow	683			
2-Nov	F	3	79	Y	Yellow	684			
2-Nov	F	3	70	N	Yellow	685			Predator Marks
2-Nov	M	3	76	N	Yellow	686			
2-Nov	F	3	67	N	Yellow	687			
2-Nov	M	2	79	N	Yellow	688			
2-Nov	F	2	75	N	Yellow	689/690			Double Tagged
2-Nov	F	2	73	N	Yellow	691			
2-Nov	M	3	81	N	Yellow	692			
2-Nov	M	3	82	N	Yellow	693			
2-Nov	F	3	74	Y	Yellow	694			
2-Nov	F	2	66	N	Yellow	695			
2-Nov	M	3	78	Y	Yellow	696			
2-Nov	F	3	73	N	Yellow	699			697/698 WASTED
2-Nov	M	3	73	N	Yellow	700			
2-Nov	M	3	81	N	Yellow	701			
2-Nov	F	3	72	N	Yellow	702			
2-Nov	M	3	75	N	Yellow	703			
2-Nov	M	3	74	N	Yellow	704			
2-Nov	M	3	72	N	Yellow	705			
2-Nov	F	2	74	N	Yellow	706			
2-Nov	M	3	81	N	Yellow	707			
2-Nov	F	2	75	N	Yellow	708			
2-Nov	F	2	60	N	Yellow	709			
2-Nov	M	3	72	N	Yellow	710			
2-Nov	M	3	77	N	Yellow	711			
2-Nov	M	3	68	N	Yellow	714			712/173 WASTED
2-Nov	M	2	78	N	Yellow	715			
2-Nov	J	2	35	N	Yellow				
2-Nov	M	2	68	N	Yellow	716			
2-Nov	J	2	34	N	Yellow				
2-Nov	F	3	59	N	Yellow	717			
2-Nov	M	3	67	N	Yellow	718			
2-Nov	F	3	81	N	Yellow	720			719 WASTED
2-Nov	M	3	70	N	Yellow	721			
2-Nov	J	2	32	N	Yellow				
2-Nov	J	2	31	N	Yellow				
2-Nov	F	3	77	N	Yellow	724			722/723 WASTED
2-Nov	F	3	66	N	Yellow	725			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
2-Nov	M	3	76	N	Yellow	726			
2-Nov	J	2	30	N	Yellow				
2-Nov	M	3	75	N	Yellow	727			
2-Nov	M	3	76	N	Yellow	728			
2-Nov	F	3	73	N	Yellow	729			
2-Nov	M	3	78	N	Yellow	730			
2-Nov	M	3	74	N	Yellow	731			
2-Nov	F	2	59	N	Yellow	733			732 WASTED
2-Nov	F	1	74	N	Yellow	734			
2-Nov	M	3	73	N	Yellow	735			Predator Marks
2-Nov	F	2	60	N	Yellow	736			
2-Nov	F	2	64	N	Yellow	737			
2-Nov	M	3	72	N	Yellow	738			
2-Nov	M	3	81	N	Yellow	739			
2-Nov	J	2	25	N	Yellow				
2-Nov	M	3	82	N	Yellow	740			
2-Nov	M	3	75	N	Yellow	741			
2-Nov	F	2	74	N	Yellow	742			
2-Nov	F	3	55	Y	Yellow	743			
2-Nov	M	3	82	N	Yellow	744			
2-Nov	F	3	68	N	Yellow	745			
2-Nov	M	3	82	N	Yellow	747			746 WASTED
2-Nov	F	2	75	N	Yellow	748			
2-Nov	J	2	30	N	Yellow				
2-Nov	J	2	27	N	Yellow				
2-Nov	F	2	53	N	Yellow	749			
2-Nov	M	3	84	N	Yellow	750			
2-Nov	M	3	79	N	Yellow	751			
2-Nov	F	3	76	N	Yellow	752			
2-Nov	F	2	67	N	Yellow	753			
2-Nov	F	2	67	N	Yellow	754			
2-Nov	F	3	54	Y	Yellow	755			
2-Nov	F	2	75	N	Yellow	756			
2-Nov	M	3	76	N	Yellow	757			
2-Nov	M	3	77	N	Yellow	758			
2-Nov	F	2	69	N	Yellow	760			759 WASTED
2-Nov	M	2	71	N	Yellow	761			
2-Nov	F	2	67	Y	Yellow	762			
2-Nov	M	3	76	N	Yellow	763			
2-Nov	M	3	84	N	Yellow	764			
2-Nov	F	1	73	N	Yellow	765			
2-Nov	F	2	74	N	Yellow	766			
2-Nov	F	3	71	Y	Yellow	767			
2-Nov	F	3	70	N	Yellow	768			
2-Nov	F	3	72	N	Yellow	772			769/770/771 WASTED
2-Nov	F	3	68	Y	Yellow	773			
2-Nov	M	3	65	N	Yellow	774			
2-Nov	F	2	70	N	Yellow	775			
2-Nov	M	3	75	N	Yellow	776			
2-Nov	F	3	74	N	Yellow	777			
2-Nov	F	3	73	N	Yellow	778			
2-Nov	F	3	70	N	Yellow	779			
2-Nov	F	3	75	N	Yellow	780			
2-Nov	F	3	67	Y	Yellow	781			
2-Nov	F	2	65	N	Yellow	782			
2-Nov	M	3	80	N	Yellow	783			
2-Nov	J	3	43	N	Yellow				
2-Nov	F	3	73	N	Yellow	784			
2-Nov	J	2	36	N	Yellow				
2-Nov	J	2	33	N	Yellow				
2-Nov	F	3	68	N	Yellow	785			
2-Nov	J	2	34	N	Yellow				
2-Nov	M	3	72	N	Yellow	786			
2-Nov	M	3	57	N	Yellow	787			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
2-Nov	F	3	78	N	Yellow	789			788 WASTED
2-Nov	M	3	76	N	Yellow	790			
2-Nov	M	3	75	N	Yellow	792			791 WASTED
2-Nov	M	3	78	N	Yellow	794			793 WASTED
2-Nov	M	3	79	N	Yellow	796			795 WASTED
2-Nov	F	3	80	N	Yellow	797			
2-Nov	J	2	37	N	Yellow				
2-Nov	F	3	76	N	Yellow	798			
2-Nov	M	3	80	N	Yellow	799			
2-Nov	F	3	74	N	Yellow	800			
2-Nov	M	3	79	N	Yellow	801			
2-Nov	M	3	74	N	Yellow	802			
2-Nov	F	3	69	N	Yellow	804			803 WASTED
2-Nov	M	3	84	N	Yellow	805			
2-Nov	F	3	78	N	Yellow	807			806 WASTED
2-Nov	F	3	66	N	Yellow	808			
2-Nov	F	3	65	N	Yellow	809			
2-Nov	F	3	65	N	Yellow	813			810/811/812 WASTED
2-Nov	F	3	77	N	Yellow	815			814 WASTED
2-Nov	F	3	72	N	Yellow	816			
2-Nov	M	3	80	N	Yellow	817			Predator Marks
2-Nov	M	3	69	N	Yellow	822			818/819/820/821 WASTED
2-Nov	M	3	75	N	Yellow	824			823 WASTED
2-Nov	F	3	58	N	Yellow	826			825 WASTED
2-Nov	F	3	57	N	Yellow	827			
2-Nov	F	3	75	N	Yellow	829			828 WASTED
2-Nov	M	3	67	N	Yellow	830			
2-Nov	M	3	78	N	Yellow	831			
2-Nov	F	3	71	N	Yellow	832			
2-Nov	F	3	64	N	Yellow	833			
2-Nov	F	3	74	N	Yellow	835			834 WASTED
2-Nov	M	3	66	N	Yellow	836			
2-Nov	F	3	65	N	Yellow	837			
2-Nov	F	3	63	N	Yellow	838			
3-Nov	M	3	74	N	Yellow	839	80522	1	
3-Nov	M	3	80	Y	Yellow	840	80522	2	
3-Nov	M	3	77	N	Yellow	841	80522	3	
3-Nov	M	3	83	N	Yellow	842	80522	4	
3-Nov	F	3	77	N	Yellow	843	80522	5	
3-Nov	M	3	82	N	Yellow	844	80522	6	
3-Nov	M	3	82	N	Yellow	845	80522	7	
3-Nov	F	3	74	N	Yellow	847	80522	8	846 WASTED
3-Nov	F	3	74	N	Yellow	848	80522	9	
3-Nov	F	3	65	N	Yellow	849	80522	10	
3-Nov	M	3	81	N	Yellow	850			
3-Nov	F	1	68	N	Yellow	851			
3-Nov	F	3	74	N	Yellow	853			852 WASTED
3-Nov	M	3	69	N	Yellow	854			
3-Nov	F	2	78	N	Yellow	855			
3-Nov	M	3	78	N	Yellow	856			
3-Nov	F	3	76	N	Yellow	857			
3-Nov	M	3	86	Y	Yellow	858			
3-Nov	M	3	82	N	Yellow	859			
3-Nov	M	3	77	N	Yellow	861			860 WASTED
3-Nov	M	3	77	-	Yellow	862			
3-Nov	J	2	32	N	Yellow				
3-Nov	F	3	68	N	Yellow	863			
3-Nov	M	3	82	N	Yellow	864			
3-Nov	F	2	79	N	Yellow	865			
3-Nov	F	3	73	N	Yellow	866			
3-Nov	F	3	63	N	Yellow	867			
3-Nov	M	3	77	N	Yellow	868			
3-Nov	F	3	81	N	Yellow	869			
3-Nov	M	3	80	N	Yellow	870			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
3-Nov	F	2	79	N	Yellow	872			871 WASTED
3-Nov	F	3	80	N	Yellow	873			
3-Nov	F	3	80	N	Yellow	874			
3-Nov	M	3	76	N	Yellow	875			
3-Nov	F	3	71	N	Yellow	877			876 WASTED
3-Nov	M	3	74	N	Yellow	878			
3-Nov	F	3	75	N	Yellow	879			
3-Nov	M	1	84	N	Yellow	880			
3-Nov	F	3	79	N	Yellow	881			
3-Nov	J	2	32	N	Yellow				
3-Nov	J	2	34	N	Yellow				
3-Nov	F	3	76	N	Yellow	883			882 WASTED
3-Nov	F	3	76	N	Yellow	884			
3-Nov	F	3	66	N	Yellow	886			885 WASTED
3-Nov	F	3	75	N	Yellow	887			
3-Nov	F	3	82	N	Yellow	888			
3-Nov	M	3	88	N	Yellow	889			
3-Nov	F	3	75	N	Yellow	891			890 WASTED
3-Nov	F	3	73	N	Yellow	893			892 WASTED
3-Nov	M	3	61	-	Yellow	894			
3-Nov	M	3	82	N	Yellow	896			895 WASTED
3-Nov	M	3	81	N	Yellow	897			
3-Nov	F	3	80	N	Yellow	898			
3-Nov	M	3	88	N	Yellow	899			Predator Marks
3-Nov	F	3	76	N	Yellow	900			
3-Nov	M	3	70	N	Yellow	901			
3-Nov	F	1	70	N	Yellow	902			
3-Nov	J	2	38	N	Yellow				
3-Nov	F	3	77	N	Yellow	903			
3-Nov	F	3	78	N	Yellow	905			904 WASTED
3-Nov	F	3	74	N	Yellow	906			
3-Nov	M	3	75	N	Yellow	907			
3-Nov	F	3	80	N	Yellow	908			
3-Nov	M	3	74	N	Yellow	909			Predator Marks
3-Nov	F	3	68	N	Yellow	910			
3-Nov	F	3	76	N	Yellow	911			
3-Nov	M	3	81	N	Yellow	913			912 WASTED
3-Nov	M	3	58	N	Yellow	914			
3-Nov	M	3	75	N	Yellow	915			
3-Nov	F	2	81	N	Yellow	916			
3-Nov	F	1	69	N	Yellow	917			
3-Nov	F	3	80	Y	Yellow	918			
3-Nov	M	1	81	N	Yellow	919			
3-Nov	M	3	85	N	Yellow	920			
3-Nov	M	3	83	N	Yellow	921			
3-Nov	F	3	79	N	Yellow	922			
3-Nov	M	3	81	N	Yellow	923			
3-Nov	M	2	81	N	Yellow	924			
3-Nov	F	3	73	N	Yellow	925			
3-Nov	M	3	78	N	Yellow	926			
3-Nov	M	3	86	N	Yellow	927			
3-Nov	F	3	66	N	Yellow	928			
3-Nov	M	3	89	N	Yellow	929			
3-Nov	F	3	76	N	Yellow	930			
3-Nov	F	2	75	N	Yellow	931			
3-Nov	M	3	84	N	Yellow	933			932 WASTED
3-Nov	F	3	59	N	Yellow	934			
3-Nov	F	3	79	N	Yellow	935			
3-Nov	M	3	76	N	Yellow	936			
3-Nov	M	3	64	N	Yellow	937			
3-Nov	M	3	79	N	Yellow	938			
3-Nov	M	3	85	N	Yellow	939			
3-Nov	M	3	79	N	Yellow	940			
3-Nov	M	3	80	N	Yellow	941			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
3-Nov	M	3	74	N	Yellow	942			
3-Nov	F	3	74	N	Yellow	943			
3-Nov	F	3	84	N	Yellow	944			
3-Nov	M	3	76	N	Yellow	945			
3-Nov	F	3	76	-	Yellow	946			
3-Nov	M	3	78	-	Yellow	947			
3-Nov	F	3	80	N	Yellow	948			
3-Nov	F	3	76	N	Yellow	949			
3-Nov	M	3	87	N	Yellow	950			
3-Nov	F	3	82	N	Yellow	951			Hook damaged mouth
3-Nov	F	2	64	N	Yellow	952			
3-Nov	F	3	72	N	Yellow	953			
3-Nov	M	2	77	N	Yellow	954			
3-Nov	M	3	81	N	Yellow	955			
3-Nov	M	3	69	N	Yellow	956			
3-Nov	M	3	77	N	Yellow	957			
3-Nov	F	1	83	N	Yellow	958			
3-Nov	F	2	73	N	Yellow	959			
3-Nov	F	3	51	N	Yellow	960			
3-Nov	F	2	72	N	Yellow	961			
3-Nov	F	3	80	N	Yellow	962			
3-Nov	M	3	83	N	Yellow	963			
3-Nov	M	3	76	N	Yellow	964			
3-Nov	F	2	72	N	Yellow	965			
3-Nov	M	3	86	N	Yellow	966			
3-Nov	F	1	81	Y	Yellow	967			
3-Nov	F	1	77	N	Yellow	968			
3-Nov	F	3	82	N	Yellow	970			969 WASTED
3-Nov	M	3	76	N	Yellow	971			
3-Nov	M	3	84	Y	Yellow	972			
3-Nov	M	3	82	N	Yellow	973			
3-Nov	F	3	80	N	Yellow	974			
3-Nov	F	3	69	N	Yellow	975			
3-Nov	F	2	73	N	Yellow	976			
3-Nov	F	1	77	N	Yellow	977			
3-Nov	F	3	81	N	Yellow	978			
3-Nov	M	3	81	Y	Yellow	979			
3-Nov	M	3	75	N	Yellow	980			
3-Nov	F	2	59	Y	Yellow	981			Using tube detector for CWT's
3-Nov	M	2	83	N	Yellow	982			
3-Nov	M	2	79	N	Yellow	983			
3-Nov	M	2	81	N	Yellow	984			
3-Nov	F	2	76	N	Yellow	986			985 WASTED
3-Nov	M	2	78	N	Yellow	987			
3-Nov	M	2	82	N	Yellow	988			
3-Nov	J	2	40	N	Yellow				
3-Nov	M	2	80	N	Yellow	989			
3-Nov	F	2	69	N	Yellow	990			
3-Nov	F	2	81	N	Yellow	991			
3-Nov	F	2	74	N	Yellow	993			992 WASTED
3-Nov	M	2	72	N	Yellow	994			
3-Nov	F	2	71	N	Yellow	996			995 WASTED
3-Nov	F	2	71	N	Yellow	997			
3-Nov	F	2	78	N	Yellow	998			
3-Nov	M	2	64	N	Yellow	999			
3-Nov	F	2	57	N	Yellow	1000			
3-Nov	F	2	75	N	Yellow	1001			
3-Nov	F	2	73	N	Yellow	1002			
3-Nov	M	2	79	N	Yellow	1003			
3-Nov	F	2	71	N	Yellow	1004			
3-Nov	M	2	77	N	Yellow	1005			
3-Nov	M	2	70	Y	Yellow	1006			
3-Nov	F	2	76	Y	Yellow	1007			
3-Nov	M	2	71	Y	Yellow	1009			1008 WASTED

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
3-Nov	F	2	66	N	Yellow	1010			
3-Nov	F	2	70	N	Yellow	1011			
3-Nov	M	2	78	Y	Yellow	1012			
3-Nov	F	2	68	N	Yellow	1013			
3-Nov	F	2	63	N	Yellow				
3-Nov	J	2	36	N	Yellow	1014			
3-Nov	F	2	76	N	Yellow	1015			
3-Nov	M	2	76	N	Yellow	1016			
3-Nov	M	2	75	N	Yellow	1018			1017 WASTED
3-Nov	F	2	73	N	Yellow	1019			
3-Nov	F	2	68	N	Yellow	1020			
3-Nov	F	2	70	Y	Yellow	1021			
3-Nov	F	2	63	N	Yellow	1022			
3-Nov	F	1	74	Y	Yellow	1023			
3-Nov	M	2	77	Y	Yellow	1024			
3-Nov	F	2	65	N	Yellow	1025			
3-Nov	F	2	75	N	Yellow	1027			1026 WASTED
3-Nov	F	1	78	N	Yellow	1028			
3-Nov	M	2	79	N	Yellow	1029			
3-Nov	F	2	74	N	Yellow	1031			1030 WASTED
3-Nov	F	2	71	N	Yellow	1032			
3-Nov	M	2	81	N	Yellow	1033			
3-Nov	F	2	74	N	Yellow	1034			
3-Nov	M	2	74	N	Yellow	1035			
3-Nov	F	2	70	N	Yellow	1038			1036/1037 WASTED
3-Nov	M	2	84	N	Yellow	1040			1039 WASTED
3-Nov	F	2	56	N	Yellow	1041			
3-Nov	F	2	79	N	Yellow	1042			
3-Nov	F	2	74	N	Yellow	1043			
3-Nov	F	2	68	N	Yellow	1044			Condition originally listed as "1\2"
3-Nov	F	2	80	N	Yellow	1045			Condition originally listed as "1\2"
3-Nov	M	2	82	N	Yellow	1046			
3-Nov	F	2	71	N	Yellow	1047			Condition originally listed as "1\2"
4-Nov	F	2	65	N	Yellow	149			148 WASTED
4-Nov	F	2	64	N	Yellow	150			
4-Nov	M	3	70	N	Clear	4601			Started the Clear Tags
4-Nov	M	3	77	N	Clear	4602			
4-Nov	F	1	70	N	Clear	4603			
4-Nov	M	3	76	N	Clear	4604			
4-Nov	F	3	77	N	Clear	4605			
4-Nov	F	2	71	N	Clear	4606			
4-Nov	M	2	72	N	Clear	4607			
4-Nov	F	3	74	N	Clear	4608			
4-Nov	M	3	79	N	Clear	4609			
4-Nov	F	2	61	N	Clear	4610			
4-Nov	F	3	63	N	Clear	4611			
4-Nov	F	3	70	N	Clear	4613			4612 WASTED
4-Nov	F	3	80	N	Clear	4614			
4-Nov	M	3	74	Y	Clear	4615			
4-Nov	M	3	82	N	Clear	4616			
4-Nov	F	3	79	Y	Clear	4617			
4-Nov	F	3	71	N	Clear	4618			
4-Nov	M	3	74	N	Clear	4619			
4-Nov	M	3	83	N	Clear	4620			
4-Nov	M	3	68	N	Clear	4621			
4-Nov	F	2	64	N	Clear	4622			
4-Nov	F	3	71	Y	Clear	4623			
4-Nov	F	3	76	N	Clear	4624			
4-Nov	M	3	78	N	Clear	4625			
4-Nov	F	3	65	N	Clear	4626			
4-Nov	M	3	85	N	Clear	4627			
4-Nov	M	3	83	N	Clear	4630			4628/4629 WASTED
5-Nov	F	2	74	N	Clear	4631			
5-Nov	M	3	82	N	Clear	4632			

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
5-Nov	M	3	80	N	Clear	4633			4634 WASTED
5-Nov	F	3	73	-	Clear	4635			
6-Nov	J	2	30	N	Clear				
6-Nov	M	2	71	N	Clear	4636			
6-Nov	F	1	55	N	Clear	4637			
6-Nov	J	2	25	N	Clear				
6-Nov	J	2	37	N	Clear				
6-Nov	M	2	70	N	Clear	4638			
6-Nov	F	2	75	N	Clear	4639			
6-Nov	F	2	74	N	Clear	4640			
6-Nov	M	2	77	N	Clear	4641			
6-Nov	M	2	72	N	Clear	4643			4642 WASTED
6-Nov	F	2	70	N	Clear	4644			Hook scar around mouth
6-Nov	F	2	72	Y	Clear	4646			4645 WASTED
6-Nov	F	1	80	N	Clear	4647			
6-Nov	F	2	67	N	Clear	4648			
6-Nov	J	2	32	N	Clear				
6-Nov	F	2	73	N	Clear	4649			
6-Nov	J	2	31	N	Clear				
6-Nov	F	2	69	N	Clear	4650			
6-Nov	F	2	60	N	Clear	4651			
6-Nov	J	2	34	N	Clear				
6-Nov	J	2	36	N	Clear				
6-Nov	J	2	30	Y	Clear				
6-Nov	F	2	64	N	Clear	4652			
6-Nov	F	2	69	N	Clear	4653			
6-Nov	J	2	31	N	Clear				
6-Nov	J	2	29	N	Clear				
6-Nov	J	2	33	N	Clear				
6-Nov	F	2	74	N	Clear	4654			
6-Nov	F	2	63	N	Clear	4655			
6-Nov	J	2	34	N	Clear				
6-Nov	F	2	70	N	Clear	4656			
6-Nov	F	2	75	N	Clear	4657			Condition originally listed as "1\2"
7-Nov	J	1	36	N	Clear				
7-Nov	M	2	81	N	Clear	4658	80523	1	
7-Nov	J	1	31	N	Clear				
7-Nov	F	2	68	N	Clear	4659	80523	2	
7-Nov	M	2	80	N	Clear	4660	80523	3	
7-Nov	F	2	71	N	Clear	4661	80523	4	
7-Nov	J	1	38	N	Clear				
7-Nov	J	1	37	N	Clear				
7-Nov	F	2	67	N	Clear	4662	80523	5	
7-Nov	J	1	34	N	Clear				
7-Nov	J	1	38	N	Clear				
7-Nov	J	1	37	N	Clear				
7-Nov	J	2	37	N	Clear				
7-Nov	J	2	31	N	Clear				
7-Nov	J	2	33	N	Clear				
7-Nov	J	2	35	N	Clear				
7-Nov	J	1	40	N	Clear				
7-Nov	F	2	76	N	Clear	4663	80523	6	1 ADULT ESCAPED
7-Nov	J	1	42	N	Clear				
7-Nov	J	1	38	N	Clear				
7-Nov	M	2	81	N	Clear	4665	80523	7	4664 WASTED
7-Nov	J	2	38	N	Clear				
7-Nov	J	2	40	N	Clear				
7-Nov	-	2	68	N	Clear	4666	8	80523	
7-Nov	J	2	37	N	Clear				
7-Nov	F	2	74	N	Clear	4667	80524	1	
7-Nov	F	2	78	N	Clear	4668	80524	2	
7-Nov	J	2	30	N	Clear				
7-Nov	J	2	33	N	Clear				
7-Nov	J	2	38	N	Clear				

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
7-Nov	J	2	37	N	Clear				
7-Nov	J	2	40	N	Clear				
7-Nov	J	2	38	N	Clear				
7-Nov	J	2	36	N	Clear				
7-Nov	J	1	39	N	Clear				
7-Nov	J	1	35	N	Clear				
7-Nov	F	2	75	N	Clear	4669	80524	3	
7-Nov	F	1	83	N	Clear	4671	80524	4	4670 WASTED
7-Nov	J	1	33	N	Clear				
7-Nov	M	2	78	N	Clear	4672	80524	5	
7-Nov	J	1	37	N	Clear				
7-Nov	J	2	35	N	Clear				Predator Marks
7-Nov	F	2	78	N	Clear	4673	80524	6	
7-Nov	F	2	80	N	Clear	4674	80524	7	
7-Nov	F	2	73	N	Clear	4675	80524	8	
7-Nov	M	2	81	N	Clear	4676	80524	9	
7-Nov	J	2	38	N	Clear				
7-Nov	F	2	79	N	Clear	4677	80524	10	
7-Nov	J	1	40	N	Clear				
7-Nov	J	2	37	N	Clear				
7-Nov	J	2	37	N	Clear				
7-Nov	F	2	77	N	Clear	4678			
7-Nov	F	2	76	N	Clear	4679			
7-Nov	J	2	32	N	Clear				
7-Nov	J	2	34	N	Clear				
7-Nov	J	2	41	N	Clear				
8-Nov	M	3	76	N	Clear	4683			
8-Nov	F	3	81	N	Clear				
8-Nov	F	3	79	N	Clear	4684			
8-Nov	J	2	35	N	Clear				
8-Nov	F	2	78	N	Clear	4685			
8-Nov	F	3	77	N	Clear	4686			
8-Nov	M	3	79	N	Clear	4687			
8-Nov	F	2	74	N	Clear	4688			
8-Nov	F	3	73	N	Clear	4689			
8-Nov	F	3	75	N	Clear	4690			
8-Nov	M	3	78	N	Clear	4691			
8-Nov	F	3	78	N	Clear	4692			
8-Nov	J	3	35	N	Clear				
8-Nov	F	3	72	N	Clear	4693			
8-Nov	J	3	37	N	Clear				
8-Nov	M	2	78	N	Clear	4694			
8-Nov	F	2	71	N	Clear	4695			
8-Nov	F	2	77	N	Clear	4696			
8-Nov	F	3	70	N	Clear	4697			
8-Nov	F	3	73	N	Clear	4698			
8-Nov	F	3	76	N	Clear	4699			
8-Nov	F	3	63	N	Clear	4700			
8-Nov	F	3	75	N	Clear	4701			
8-Nov	J	3	32	N	Clear				
9-Nov	F	3	71	N	Clear	4702			
9-Nov	M	3	70	N	Clear	4703/4704			Double Tagged
9-Nov	F	3	79	N	Clear	4705			
9-Nov	J	2	35	N	Clear				
9-Nov	M	3	74	N	Clear	4706			
9-Nov	J	2	39	N	Clear				
9-Nov	F	2	75	N	Clear	4707			
9-Nov	M	3	87	N	Clear	4708			
9-Nov	J	2	30	N	Clear				
9-Nov	F	2	72	N	Clear	4709			
9-Nov	F	3	81	N	Clear	4710			
9-Nov	F	3	78	N	Clear	4711			
9-Nov	M	3	76	N	Clear	4712			
9-Nov	J	2	35	N	Clear				

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
9-Nov	M	3	67	N	Clear	4713			
9-Nov	J	2	28	N	Clear				
9-Nov	F	2	76	N	Clear	4714			
9-Nov	J	2	27	N	Clear				
9-Nov	M	3	81	N	Clear	4715			
9-Nov	J	2	38	N	Clear				
9-Nov	M	3	76	N	Clear	4716			
9-Nov	F	3	76	N	Clear	4717			
9-Nov	F	2	69	N	Clear	4718			
9-Nov	F	2	74	N	Clear	4719			
9-Nov	M	3	81	N	Clear	4730			
9-Nov	M	3	78	N	Clear	4731			
9-Nov	F	3	75	N	Clear	4732			
9-Nov	M	3	78	N	Clear	4733			
9-Nov	F	2	72	N	Clear	4734			
9-Nov	J	2	34	N	Clear				
9-Nov	M	3	72	N	Clear	4735			
9-Nov	J	3	39	N	Clear				
9-Nov	F	3	73	N	Clear	4736			
9-Nov	J	3	40	N	Clear				
9-Nov	M	3	56	N	Clear	4737			
9-Nov	J	2	30	N	Clear				
9-Nov	J	2	37	N	Clear				
9-Nov	F	3	75	N	Clear	4738			
9-Nov	M	3	85	N	Clear	4739			
9-Nov	J	3	40	N	Clear				
9-Nov	F	3	68	N	Clear	4740			
9-Nov	M	3	83	Y	Clear	4741			
9-Nov	F	3	78	N	Clear	4742			Loose Eggs
9-Nov	M	3	78	N	Clear	4743			
9-Nov	M	3	78	N	Clear	4744			Bashed Nose
9-Nov	J	3	37	N	Clear				
9-Nov	J	3	34	N	Clear				
9-Nov	J	3	40	N	Clear				
9-Nov	F	3	75	N	Clear	4745			
9-Nov	J	3	37	N	Clear				
9-Nov	J	3	37	N	Clear				
9-Nov	J	3	37	N	Clear				
9-Nov	M	3	74	N	Clear	4746			
10-Nov	J	3	32	N	Clear				
10-Nov	J	3	29	N	Clear				
10-Nov	F	2	76	N	Clear	4747	80525	1	
10-Nov	J	3	31	N	Clear				
10-Nov	F	2	73	N	Clear	4750	80525	2	4748/4789 WASTED
10-Nov	F	3	70	N	Clear	4751	80525	3	
10-Nov	J	3	35	N	Clear				
10-Nov	J	3	33	N	Clear				
10-Nov	J	3	37	N	Clear				
10-Nov	J	3	36	N	Clear				
10-Nov	J	3	29	N	Clear				
10-Nov	F	3	65	N	Clear	4753	80525	4	4752 WASTED
10-Nov	F	3	75	N	Clear	4754	80525	5	
10-Nov	F	3	68	N	Clear	4755	80525	6	
10-Nov	F	3	74	N	Clear	4756	80525	7	
10-Nov	F	3	70	N	Clear	4758	80525	8	4757 WASTED
10-Nov	F	3	72	N	Clear	4759	80525	9	
10-Nov	J	3	28	N	Clear				
10-Nov	F	3	53	N	Clear	4760	80525	10	
10-Nov	F	3	72	Y	Clear	4761			
10-Nov	J	3	27	N	Clear				
10-Nov	F	3	76	N	Clear	4762			
10-Nov	M	3	79	N	Clear	4763			
10-Nov	J	2	34	-	Clear				
10-Nov	J	3	32	-	Clear				

Sample Date	Sex	Cond-ition	Length (cm)	CWT	Tag Color	Tag Number	Scale	Scale Book	Comment
10-Nov	J	3	35	N	Clear				
10-Nov	J	3	33	N	Clear				
10-Nov	J	2	36	N	Clear				
10-Nov	J	3	35	N	Clear				
10-Nov	J	3	38	N	Clear				
10-Nov	F	3	71	N	Clear	4764			
10-Nov	J	3	31	N	Clear				
10-Nov	F	2	73	N	Clear	4765			
10-Nov	J	3	29	N	Clear				
10-Nov	M	3	78	N	Clear	4766			
10-Nov	J	3	34	N	Clear				
10-Nov	J	3	37	N	Clear				
10-Nov	J	3	35	N	Clear				
10-Nov	M	3	82	N	Clear	4767			
10-Nov	J	3	32	N	Clear				
10-Nov	J	3	26	N	Clear				
10-Nov	J	3	29	N	Clear				
10-Nov	J	3	28	N	Clear				
10-Nov	M	3	67	N	Clear	4768			
10-Nov	M	3	89	N	Clear	4769			
10-Nov	M	3	78	N	Clear	4770			
10-Nov	J	3	30	N	Clear				
10-Nov	F	3	67	N	Clear	4771			
10-Nov	J	3	32	N	Clear				
10-Nov	J	3	33	N	Clear				
10-Nov	J	2	31	N	Clear				
10-Nov	J	2	33	N	Clear				
10-Nov	J	2	34	N	Clear				
10-Nov	J	2	31	N	Clear				
10-Nov	J	2	34	N	Clear				
10-Nov	J	3	29	N	Clear				
11-Nov	M	3	86	N	Clear	4776			
11-Nov	J	2	38	N	Clear				TROUT
11-Nov	J	2	36	N	Clear				2 TROUT
11-Nov	J	2	34	N	Clear				
11-Nov	F	2	73	N	Clear	4778			4777 WASTED
11-Nov	M	3	71	N	Clear	4779			
11-Nov	M	3	80	N	Clear	4780			2 TROUT
11-Nov	J	2	37	N	Clear				Adult Escaped
11-Nov	M	2	77	N	Clear	4781			
11-Nov	M	2	72	N	Clear	4801			
11-Nov	M	2	63	N	Clear	4802			
11-Nov	J	2	33	N	Clear				
12-Nov	F	3	71	N	Clear	4805			4803/4804 WASTED
12-Nov	F	3	71	N	Clear	4806			
12-Nov	J	3	32	N	Clear				
12-Nov	F	3	75	N	Clear	4808			4807 WASTED
12-Nov	J	3	37	N	Clear				
12-Nov	J	3	36	N	Clear				
12-Nov	J	3	38	N	Clear				
12-Nov	J	3	40	N	Clear				
12-Nov	F	3	76	N	Clear	4809			
12-Nov	J	3	30	N	Clear				
12-Nov	M	3	72	-	Clear	4810			
12-Nov	J	3	36	-	Clear				
13-Nov	M	3	58	N	Clear	4811			
13-Nov	F	2	79	-	Clear	4812			
13-Nov	J	2	38	N	Clear				
13-Nov	F	3	78	N	Clear	4813			

Appendix H. Non-coho data, Black Creek fall fence, 2008.

Species	Sample Date	Sex	Condition	Length (cm)	CWT?	Tag	Tag Number	Scale	Scale Book
Chinook	6-Nov	F	2	86	N	Clear	-	-	-
Chum	20-Oct	F	1	65	N	Yellow	-	-	-
Chum	31-Oct	M	2	69	N	Yellow	289	-	-
Chum	31-Oct	M	3	74	N	Yellow	297	-	-
Chum	31-Oct	M	2	57	N	Yellow	-	-	-
Chum	1-Nov	F	2	70	N	Yellow	504	-	-
Chum	6-Nov	M	2	80	N	Clear	-	-	-
Chum	6-Nov	M	2	69	N	Clear	-	-	-
Chum	10-Nov	M	1	76	N	Clear	-	-	-
Chum	13-Nov	F	2	74	-	Clear	-	-	-
Trout	8-Oct	-	1	28	N	Yellow	-	-	-
Trout	31-Oct	-	2	40	-	Yellow	-	-	-
Trout	31-Oct	J	2	40	-	Yellow	-	-	-
Trout	1-Nov	M	1	32	N	Yellow	-	-	-
Trout	1-Nov	M	2	30	N	Yellow	-	-	-
Trout	7-Nov								